BRITISH MUSEUM NATURAL HISTORY
PRESENTED
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PROCEEDINGS

OF THE

Bournemouth Natural Science Society.

VOL. XXIII.

SESSION 1930-31.

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BRITISH MUSEUM
NATURAL HISTORY

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Introductory Note.

THE Bournemouth Natural Science Society was founded in 1903, being the successor to an older society which was formed in 1883 and dissolved in 1897. The early meetings of the Society were held in a room hired from time to time for the purpose, but the need of some fixed quarters was soon felt. To meet this need a small room was taken at 122 Old Christchurch Road, and, as this proved inadequate, in February, 1909, better accommodation was secured at Granville Chambers and retained for four years. In March, 1913, the Society took on lease from the Education Committee a large room on the ground floor of the Municipal College. In 1919 this also had to be given up, and the Society succeeded in acquiring a house of its own, 39 Christchurch Road. The formal opening was on February 7, 1920. In 1929 a Lecture Hall was added, and the ground floor of the old building reconstructed. The work was completed and the New Hall inaugurated on October 14, 1929.

The objects of the Society are declared by the second of its rules to be " the promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, and the formation of Sections of its members devoted to any particular branch of the Society's work, and in any way that the Council of the Society shall deem advisable."

The Sections at present working are as follows:—**Archæological and Historical, Astronomical, Botanical, Entomological, Geographical, Geological, Microscopical, Photographic and Record, Physical, and Zoological.**

During the WINTER SESSION, from October to April, GENERAL and SECTIONAL MEETINGS are held, comprising Lectures and Demonstrations on subjects of scientific interest, illustrated by lantern slides, diagrams, specimens or experiments.

All meetings are open to all members of the Society.

Throughout the SUMMER SESSION, EXCURSIONS to places of interest in the neighbourhood are arranged and indoor or garden meetings occasionally held.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting, held in October.

The Society possesses a Library available for the use of members. This is yearly becoming more extensive and valuable by the acquisition of standard text books and of books dealing with matters of local scientific interest. Books may, under certain conditions, be borrowed by members, and there is a Reading Room in which works of reference may be consulted.

The Society's collections of archæological, botanical, geological, zoological and other specimens are now arranged in the MUSEUM. Articles on the collections were contributed to Vols. V. X. and XVII. of the Proceedings by Sir Daniel Morris, Mr. W. G. Wallace and Rev. C. O. S. Hatton respectively.

Members are elected by the Council and pay an annual subscription of £1 for full membership (admitting to all meetings and excursions for the year), a subscription of £2 covers four adult members of the same family residing in the same house.

A MONTHLY NOTICE, giving full details of all meetings, etc., is posted to every member before the beginning of each month, and a volume of Proceedings is published every year.

Application Forms for Membership, and further particulars, can be obtained from the

HON. SECRETARY,

Bournemouth Natural Science Society.
39 Christchurch Road,
Bournemouth.

Bournemouth Natural Science Society.

OFFICERS AND COUNCIL FOR 1930-1931.

President

Henry Bury, M.A., F.L.S., F.G.S.

Vice-Presidents

G. E. J. Crallan, M.A., M.B., M.R.C.S.
Rev. C. O. S. Hatton, B.A., F.L.S.
Claude Lyon
F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
R. V. Sherring, F.L.S.
Heywood Sumner, F.S.A.
Sir Daniel Morris, K.C.M.G., J.P., M.A., D.SC., D.C.L., LL.D., F.L.S.

Chairman of Council

Rev. C. O. S. Hatton, B.A., F.L.S.

Deputy-Chairman of Council

F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.

Council

The Officers, and Chairmen of Sections (ex-officio)
F. Broad
E. St. John Burton, F.G.S., F.L.S.
Miss C. H. Fryer
F. W. Longbottom, F.R.A.S.
Miss S. G. Rooke
J. H. Scott, M.E., M.I.M.C.E.
J. F. Spencer
W. J. Woodhouse, A.C.P.

Chairmen of Sections

Archæological and Historical : R. K. Cardew, B.A.
Astronomical : J. A. Formoy, F.R.A.S. ; W. Goodacre, F.R.A.S.
Botanical : L. Beeching Hall, F.L.S.
Entomological : Alan Druitt, F.E.S.
Geographical : Claude Lyon.
Geological : Henry Bury, M.A., F.L.S., F.G.S.
Microscopical : F. B. Taylor, B.A. ; S. Whitaker.
Photographical and Record : S. Whitaker.
Physical : Miss Marcia Penrose, B.SC.
Zoological : F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
Rev. F. C. R. Jourdain, M.A., F.Z.S., M.B.O.U.

Hon. Treasurer

G. Brumell, A.R.I.B.A., Maori, 15 Richmond Park Avenue.

Secretaries

Hon. Secretaries : Rev. A. G. Yates, M.A., R.N., 14 Wellington Road.
M. Hellier, O.B.E., 22 Knole Road.

All official correspondence should be addressed to the latter.

Hon. Assistant Secretary : W. J. Woodhouse, A.C.P., M.I.H., 35 Chatsworth Road.

Assistant Secretary : J. F. Spencer, Glenthorne, Richmond Park Road.

Hon. Librarian

Claude Lyon, Shalimar, Wilderton Road.

Hon. Editor

J. R. White, M.A., Whitecot, Linwood Road.

Hon. Curator

Rev. C. O. S. Hatton, B.A., F.L.S., Hinton Vicarage, Christchurch.

Hon. Auditors

E. Bicker & Son. F. Broad.

Bankers

National Provincial Bank of England, Bournemouth.

List of Members.

Revised to 8th November, 1931.

* Honorary Members. † Past Presidents.
o Original Members.
G Morris Gold Medallist. A Associate Members.
The year of election is given before the name of each member.

A

1931	A'Bear, Miss J. M.	31 Chigwell Road
1931	Adams, V. J.	7 Holdenhurst Road
1931	AAdcock, Mrs. R. D.	Newbold Verdun, Orchard Avenue, Parkstone
1928	AAdcock, Miss M. D., B.SC.	,, ,, ,,
1927	Adkins, H.	Glenavon, 107 Alumhurst Road
1924	Amos, Miss E.	Langley Dene, 55 Wellington Road
1920	Anderson, Col. E. B., C.B.E.	Woodmanton, 35 Wellington Road
1922	Anderson, Col. R. F.	Glenalmond, 5 Madeira Road
1923	Anderson, Mrs.	,, ,, ,,
1923	Anderson, Mrs. M.	Ranfurly, 18 Dean Park Road
1911	Atkins, Mrs.	10 Fortescue Road
1926	Audain, Mrs. N. M.	1 Durrant Villas, Avenue Road

B

1906	Backhouse, H., F.R.H.S.	Hill House, 10 Parsonage Road
1929	Baker, H. J., F.I.A.	Clifton, Sandbourne Road
1929	Balfour, Col. J. H.	The Brown House, Ferndown
1928	Ball, Miss J. E.	Restawhile, Whitecliff Road, Parkstone
1930	Banks, R. McLachlan, M.B., C.M., D.P.H.	Carisbrooke, Tregonwell Road
1922	Barker, S.	66 West Cliff Road
1921	Barker, Miss W.	,, ,,
1905	Barlow, E. W., B.SC., F.R.A.S., F.R. MET. S.	Greengates, Wadhurst, Sussex
1912	ABarraclough, A., M.A., F.R.G.S.	173 Richmond Park Road
1909	Barratt, J. Hayes	Brundon, 2 Surrey Road
1924	Barratt, Mrs.	,, ,,
1924	Barratt, Miss P. M.	,, ,,
1930	Barroll, Mrs.	4 Exeter Mansions, Exeter Park Road
1920	Bartlett, P. R.	35 King's Park Road
1930	Barton, C. P.	11 Beechey Road
1930	Barton, Mrs.	,, ,,
1927	Bater, G. W., B.A.	22 Dingle Road
1927	Bater, Mrs.	,, ,,
1927	Bater, Miss K. J.	,, ,,
1928	Beale, J. Bennett	Sunnycourt, Glenferness Avenue
1918	Beale, Mrs.	,, ,,
1928	Beale, Miss E. E.	,, ,,
1931	Beckett, S. J.	Pineville Hotel, West Cliff Gardens
1904	Bennett, H. Morden	Sweet Briar, 12 Derby Road
1920	Bennett, Risdon, M.A.	Yew Tree Cottage, Broadstone
1921	Bevan, Trevor	17 Stirling Road

1923	Bishop, E.	21 Surrey Road
1912	Blackall, Miss E. E.	31 Wentworth Avenue, Boscombe
1931	Blamey, Col. E. H.	Cortina I, 87 Alumhurst Road
1931	Blamey, Mrs.	,, ,, ,,
1910	*Bond, F. Bligh, F.R.I.B.A.	454 Gloucester Road, Bristol
1920	Borrett, Surgeon-Capt. G. G., R.N.	62 Alum Chine Road
1924	Bottomley, Miss O.	Langley Dene, 55 Wellington Road
1929	Bourdass, Miss A.	7 Beaulieu Road
1929	Bourdass, Miss F.	,, ,,
1920	ABourne, Miss C. M.	2 Herberton Road, West Southbourne
1930	†*Bower, Prof. F. O., D.SC., F.R.S.	2 The Crescent, Ripon
1927	Boyt, Miss J.	1 Ascham Road
1914	Bradbury, Miss E.	La Bocca, 2 Portarlington Road
1922	Brewitt-Taylor, Mrs. Ray	10 Forest Road, Branksome Park
1931	Bright, Percy M.	Nethercourt, 60 Christchurch Road
1926	Broad, F., F.S.I.	Manton Villa, 2 Oxford Road
1928	Broad, Mrs.	,, ,,
1921	Bromley, Miss	81 Lansdowne Road
1931	Brotherton, Commr. M., R.N.	Fairlie, Martello Road, Canford Cliffs
1917	Brown, Edward	West Ridge, Chessel Avenue
1917	Brown, Mrs.	,, ,,
1924	Brown, Miss F.	Chobham House, 4 St. Winifred's Road
1926	Brown, Lt.-Col. F. Tatton	Talbot Hurst, 3 Glenferness Avenue
1923	Browne, John	Serantes, Glen Road, Boscombe
1924	Browning, Miss E. M.	Littleholm, Ferndown
1905	Brumell, G., A.R.I.B.A.	Maori, 15 Richmond Park Avenue
1920	Brumell, Mrs.	,, ,, ,,
1929	Brumell, Miss H. M.	,, ,, ,,
1920	Brumell, Miss M.	,, ,, ,,
1920	Bryant, Miss M.	Sunnyhill, Hampden Lane, W. Southbourne
1929	Buckingham, H.	6 Bodorgan Road
1929	Bunce, Miss A. M.	51 Mansfield Road, Parkstone
1930	Bunce, Miss F. E.	,, ,, ,,
1929	Burge, J. T.	Glenhurst, Braeside Road, West Moors
1924	Burgess, J.	Kempston, Chine Crescent Road
1931	Burnham, S. J.	24 Barton Road, Branksome
1927	Burrell, Mrs. A. E.	Freydan Lodge, Poole Road
1924	Burroughs, F. G.	63 Maxwell Road
1919	Burstal, E., M.D.	46 Lansdowne Road
1926	Burstal, E. K., M.I.C.E.	27a Grove Road
1926	Burstal, Mrs.	,, ,,
1922	Burton, E. St. John, F.L.S., F.G.S., F.Z.S.	Melville, 4 Howard Road
1922	†Bury, Henry M.A., F.L.S., F.G.S.	The Gate House, 17 Alumdale Road
1930	Bury, Mrs.	,, ,, ,,
1930	Bury, Miss G. E.	,, ,, ,,
1930	Bury, Miss G. I.	,, ,, ,,
1930	Butler, G. W.	Seacombe, 54 Wimborne Road, Poole

C

1928	Calkin, J. B., M.A.	Wychwood School
1924	Campbell, Mrs.	Whingate, Broadstone
1919	Cardew, R. K., B.A.	Stafford Lodge, 26 Dean Park Road
1920	Cardew, Mrs.	,, ,, ,,
1931	Carr, Claude A.	Silverwood, Balcombe Road
1931	Carr, Mrs.	,, ,, ,,

1912	Carus-Wilson, C., J.P., F.R.S. (Edin.), F.G.S.	Altmore, Waldegrave Park, Strawberry Hill, Middlesex.
1930	Chadwick, Mrs. E.	Oriana, Burton Road
1925	Chilver, Mrs. E. K.	2 Shaftesbury Road
1912	AChilver, Miss K. M.	,, ,,
1927	Christy, R. W.	Greyfriars, Ringwood
1926	Clare, Mrs.	48 Queen's Park West Drive
1931	Clark, Miss K. E.	15a St. Mary's Road
1927	*Clay, R. C. C., M.D., F.S.A.	The Manor House, Fovant, Wilts
1931	Clegg, J. H.	Mount Pleasant, Bury Road, Branksome Park
1929	Colledge, T. C.	3 Watkin Road, Boscombe
1928	Connah, J., B.SC., F.I.C.	Brae Top, Highland Road, Parkstone
1928	Constantine, M. H.	Brendon, Nairn Road
1929	Cooke, A. C., O.B.E.	19a Knyveton Road
1929	Cooke, Miss I. D.	,, ,,
1912	Cooper, Ernest	100 Old Christchurch Road
1926	Cooper, H. A.	25 Talbot Avenue
1926	Cooper, J. S.	The Little Red House, Colehill, Wimborne
1930	Cooper, Miss Marion	Lymers Ley, Byron Road, Boscombe
1903	†oCrallan, G. E. J., M.A., M.B., M.R.C.S.	17 St. Anthony's Road
1922	Crallan, Mrs.	,, ,,
1920	Cressey, Miss H.	Bramcote, 1 Glen Road, Boscombe
1930	Crocker, Col. H. E., C.M.G., D.S.O., F.R.G.S.	Carlton House, Moorland Road
1930	Crocker, Mrs.	,, ,, ,,
1931	Crocker, Mrs. Walter	Highridge, Ferndown
1922	Crowther, Miss V.	Berwyn Bank, Poulner Hill, Ringwood
1931	Curgenven, Miss A. J.	6 Suffolk Road
1922	Curme, Miss M. E.	65 Lansdowne Road
1930	ACurry, Denis	Lynton, Alyth Road
1928	Curtis, E. A., L.D.S.	Holm Dene, Poole Road
1928	Curtis, Mrs.	,, ,,
1928	Curtis, E. J. B., L.D.S.	,, ,,
1903	oCurtis, W. Parkinson, F.E.S.	Drake North, Sandringham Road, Parkstone
1922	*Elected an Honorary member	

D

1927	Dacombe, J. M. J.	Gosfield Cottage, Winkton, Christchurch
1920	Darke, Miss W. E.	25 Hawkwood Road, Boscombe
1921	ADavies, Miss H. V., B.SC.	Municipal College
1930	Dawes, Miss E. M.	85 Fitzharris Avenue
1929	Dawson, Miss L. N.	20 Carbery Avenue
1924	Deas, J., M.A., I.C.S.	57 Wellington Road
1930	de Castro, H.	Seldown House, Poole
1926	de Paiva, Miss E.	Sunny Halt, Hamilton Road, Boscombe
1914	Dickson, Col. W. D., J.P.	Southill, 32 Dean Park Road
1914	Dickson, Mrs.	,,
1924	Dieselhorst, Mrs.	50 Surrey Road
1903	o*Dixon, J. R. L., M.R.C.S., L.R.C.P.	
1928	Dodds, H.	19 Foxholes Road, Southbourne
1910	Dodshon, E., LL.B.	126 Old Christchurch Road
1928	Drew, Lt.-Col. C. D., D.S.O., F.S.A.	Dudsbury House, Longham, Wimborne
1929	Drew, R. C.	66 Wimborne Road
1929	Drew, Mrs. E. M.	,, ,,
1929	Drew, R. E. I.	,, ,,

1923	Druitt, Alan, F.E.S.	Willow Lodge, Mudeford, Christchurch
1923	Druitt, Mrs.	,, ,, ,, ,,
1925	Druitt, Miss C. M.	99 Lowther Road
1925	Druitt, Miss C. S.	,, ,,
1928	Dundee, Col. W. J., C.I.E., R.E., F.R.G.S.	38 Portchester Road
1926	Dundee, Mrs.	,, ,,
1921	Dunn-Gardner, R. C.	24 Queensberry Place, S. Kensington, S.W.7

E

1924	Edwards, Miss M. J.	Aysgarth, 16 Poole Road
1929	Eldridge, Mrs. H.	L'Incontro, 9 Penn Hill Avenue, Parkstone
1923	Ellen, Miss Doris M.	Rosemary Cottage, Frogham, Fordingbridge
1922	Ellis, Mrs.	10 Forest Road, Branksome Park
1922	Ellis, Miss W. M.	,, ,, ,,
1923	Elrington, R.	Mavis Bank, 15 Bodorgan Road
1923	Elrington, Mrs.	,, ,,
1922	Elwes, Mrs.	Corner House, Little Forest Road
1924	Ensor, Mrs.	26 Frederica Road, Winton
1929	Evans, C. I., M.A.	Boundway Top, Sway, Lymington
1909	Evans, P. H. L., M.A.	Stirling House, 28 Manor Road
1927	Exon, C., M.A.	Aldermoor, Douglas Road, Southbourne

F

1920	Fairbrother, Miss L.	4 Golf Bungalows, Hindhead, Surrey
1919	Farmar, Mrs. K. A.	Whitton Lodge, Stevenson Crescent, Parkstone
1922	Farmar, Miss E. A.	,, ,, ,, ,,
1929	Fell, Mrs. Henry	9 Branksome Wood Road
1914	Fielding, T., M.D.	Genesta, West Hill Road
1927	Finlinson, F. J.	Daneshill, Queen's Park Avenue
1903OA	Firbank, Miss, LL.A., A.C.P.	5 Buchanan Avenue
1931	Firth, Mrs. M. P.	14 Oban Road
1931	Fish, Rev. A. H.	Cobhurst, Links Road, Parkstone
1931	Fish, Mrs.	,, ,, ,,
1922	Fonblanque, Miss Ida	4 Gordon Road
1929	Forbes, A. G.	51 Ophir Road
1917	Forrest, Mrs.	Hip Roof, Benellen Road
1925	Fountain, E. D., L.R.C.P., M.R.C.S.	Vron, 30 Mansfield Road, Parkstone
1922	Fowler, A. R. W., B.A.	St. Ina, Beechwood Avenue
1922	Fowler, Mrs.	,, ,, ,,
1919	Fowler, Miss M. L.	Lerryn, Chessel Avenue
1924	Freer, Miss L. W.	1 Branksome Park Avenue
1927	French, F. W.	1 Ascham Road
1927	French, Miss J. E.	,, ,,
1909	French, J. M.	Jumpers House, Christchurch
1923	Fryer, Miss C. H.	Moulton, 46 Wellington Road
1928	Fryer, Miss G. M.	4 Milton Road
1928	Fulcher, L. W., B.SC.	60 Herberton Road

G

1929	Gallaher, Miss M.	60 Surrey Road
1922	Gardiner, Miss F. M.	3 Adeline Road, Boscombe

1926	Gardiner, H. L.	3 Adeline Road, Boscombe
1922	Gatty, Lady K.	Ossemsley Manor, Christchurch
1922	Gatty, Miss H.	,, ,,
1922	Gatty, Oliver	,, ,,
1922	Gatty, Richard	,, ,,
1931	Geake, W. E.	6 Hathaway Road, Southbourne
1923	Gibbs, F. L. A.	Hawthorns Hotel, West Cliff Road
1921	Gibbs, G. F.	Fairview, 13 Herbert Road
1925	Gill, Miss Ida	Rosslyn, Seldown, Poole
1922	Gill, Major W. R.	Chewton Lodge, Highcliffe
1923	Gill, Mrs.	,, ,, ,,
1924	Goddard, Rev. C. V.	62 Parkwood Road, Boscombe
1931	Goldie-Scot, T., M.B., C.M. (Edin), M.R.C.S., L.R.C.P., J.P.	5 Alton Road, Parkstone
1929	Goodacre, W., F.R.A.S.	Waratah, Leicester Road
1931	Goodman, C. H.	8 Foxholes Road, Southbourne
1927	Gorton, B., M.R.C.V.S., M.P.S.	22 Arnewood Road
1921	Gosse, W., M.D., D.P.H.	Langley, Rowlands, Wimborne
1929	Graves, Basil, M.C., M.A., M.R.C.S., L.R.C.P.	13 Wimborne Road
1929	Graves, Mrs.	,, ,,
1904	Gray, Arthur	Woodville, 26 Melville Road, Winton
1914	Greves, E. Hyla, M.D., F.R.C.P.	Rodney House, 19 Poole Road
1917	Grindley, Miss E. J.	Milnthorpe, Rossmore Avenue, Parkstone
1929	Gurney, Miss A.	20 Carbery Avenue

H

1930	Haines, H. H., C.I.E., F.L.S.	Glen Ashton, Wimborne
1931	Haines, Miss E. S.	,, ,,
1931	Haines, Mrs. E. M.	Appleslade, Ringwood
1924	Hall, L. Beeching, F.L.S.	Lingdene, King's Avenue, Parkstone
1929	Hall, R. Radclyffe	31 R. L. Stevenson Avenue
1929	Hall, Mrs.	,, ,,
1929	Hallowes, G. P. B., F.R.A.S.	The Sheiling, Colehill, Wimborne
1930	Hardwick, Miss R.	143 Alexandra Road, Parkstone
1913	Harris, Miss K.	Trescott Grange, Harvey Road, Boscombe
1912	Harrison, Henry	Eden Lodge, 7 Surrey Road South
1926	Harrison, Miss M. P.	Hinton Vicarage, Christchurch
1931	Harrison, Mrs.	64 Parkwood Road
1929	Harrison, Miss N. B.	,, ,,
1914	Hartley, Dr. J.	62 Portchester Road
1914	Hartley, Mrs.	,, ,,
1922	Hartley, J. A.	,, ,,
1927	Hartree, D. G.	197 Holdenhurst Road
1914	Hatton, Rev. C. O. S., B.A., F.L.S.	Hinton Vicarage, Christchurch
1921	*Elected an Honorary Member	
1920	Hawes, Miss	The Moorings, 27 Nelson Road
1917	Haydon, C. J.	Ben Veula, 29 West Cliff Road
1918	Haythorne, E. C. C.	Forest Lodge, Burton Road, Branksome Park
1930	Heigham, Norman	14 Talbot Avenue
1931	Hellier, M., O.B.E.	22 Knole Road
1931	Hellier, Mrs.	,, ,,
1921	Hellyar, Miss E. F.	Cerne Abbas, 1 Belvedere Road
1917	Henderson, Miss A. J.	Springbank, 22 Fox Road, Greenock
1927	Henderson, F. W., L.R.C.S.I.,	Two Oaks, Bosley Way, Christchurch
1928	Henderson, Major H. E.	Tall Trees, Wayside Road, Southbourne
1928	Henderson, R. G., M.A., M.B., Ch.B. (Aber.), F.R.C.S. (Edin.)	87a Southbourne Road

1931	Herklots, H.	Ourden, Highcliffe
1931	Herklots, Mrs.	,, ,,
1930	Heynen, R. H.	The Cliffeside, East Cliff
1923	Hill, C. S.	Northfield, Chigwell Road
1930	Hilton-Johnson, Miss C.	12 Oban Road
1924	Hoare, Miss E.	Sea Gate, Cassel Avenue
1922	Holdom, Mrs. E.	Cranfield, Mansfield Road, Parkstone
1909	Holmes, Mrs.	Brackenwood, 37 Southern Road, West Southbourne
1911	Holmes, Miss S. C. M.	c/o National Provincial Bank, Southbourne Grove
1911	Homer, L. V. C.	1 Carlton Road
1931	Homfray, Mrs. F.	Old Cot, Linwood, Ringwood
1929	Hooper, Miss M. N.	Southland, Corfe Castle
1928	Horne, Rev. E. H., M.A.	64 Alum Chine Road
1929	Houghton, Miss J.	20 St. Anthony's Road
1930	How, Miss E. A.	71 Victoria Park Road, Winton
1928	Howard, A. F.	Hawthorns Hotel, West Cliff
1924	Howell, W. Rees	Cintra, 35a Richmond Wood Road
1923	Howell, Mrs. Rees	,, ,, ,,
1911	Hudson, F.	Penarol, Parkstone
1911	Hudson, Mrs.	,, ,,
1925	Humby, H. G.	Brackendene, 23 Wimborne Road
1927	Hunt, Mrs. F.	33 Stirling Road
1926	Hurry, Mrs. G. L.	Hinton Firs, 9 Manor Road
1926	Hurry, A. G., M.A.	,, ,, ,,
1930	Hurt, Miss C. E. C. J.	Ingleby Cottage, Wimborne Road
1931	Hutchins, W. A., B.A.	Chilterns, Watcombe Road

I

1905	Ibbett, F. W., M.A.	Town Hall
1920	*Elected an Honorary Member	
1927	Ingram, Miss S. I. C., B.SC.	Caldicott, Anthony's Avenue, Parkstone
1926	Innes, A. A.	Old Pines, Ferndown
1925	Insch, J. M.	18 Beechwood Avenue
1925	Insch, Mrs.	,, ,,
1930	Insch, Miss E.	,, ,,
1930	Insch, Miss S.	,, ,,

J

1926	Jackson, Mrs. C. M.	The Dakota, Beaulieu Road, Alum Chine
1921	Jackson, Mrs. Gidlow	64 Portchester Road
1930	Jefferys, J. H.	Elpis, Caledon Road, Parkstone
1923	Jenkins, Miss B. M.	7 Talbot Avenue
1930	Jones, Miss A. Parnell	Menstone, Frankland Crescent, Parkstone
1922	Jones, J. Williamson	Tyndale Lodge, Forest Road, Branksome Park
1930	Jones, Mrs. W.	1 Park Road
1927	Jourdain, Rev. F. C. R., M.A., F.Z.S., M.B.O.U.	4 Belle Vue Road, Southbourne
1930	Jubb, Miss O.	12 Oban Road

K

1910	Kay, A. J.	Valliscourt, 100 Lowther Road
1931	Kay, Mrs. E.	Overseas Club, Hinton Road
1930	†*Keeble, Sir F. W., K.B.E., D.SC., F.R.S.	Hammels, Boars Hill, Oxford
1929	Kendall, Mrs.	20 Serpentine Road, Poole

1928	Kendall, Miss G. J., A.R.C.M.	20 Serpentine Road, Poole
1931	Keogh, Rev. C. G. P.	Roselands, Lansdowne Road
1931	Keogh, Mrs.	,, ,, ,,
1927	Kilburn, Miss Alice M.	9 Glenmoor Road, Winton
1927	Kilburn, Miss Annie	,, ,,
1931	King, Miss E.	Redmoor School, Canford Cliffs
1929	Kirkaldy, D.	Grange, Spur Hill Avenue, Parkstone
1929	Kirkaldy, Mrs. A.	,, ,, ,,
1929	Kirkaldy, Miss J.	,, ,, ,,
1929	Kitchin, E. H., M.A., M.B.	Haldon, Canford Cliffs

L

1928	Lane, F. E.	41 St. Alban's Avenue
1930	Lattey, W. F.	10 Owls Road, Boscombe
1930	Lattey, Mrs.	,, ,,
1930	Laughlin, Col. C.	21a Belle Vue Road, Southbourne
1923	Lawrence, Mrs.	66 Portchester Road
1929	Lawson, Miss M.	41 Fortescue Road
1929	ALee, Miss L., LL.A., F.R.G.S., F.A.G.S.	69 Walpole Road
1930	Lefroy, Mrs.	Campbell House, Campbell Road, Boscombe
1910	Lendrum, Miss A. M.	13 Carysfort Road
1930	Lewis, Miss G.	Wootton Heath Cottage, New Milton
1930	Lillie, Miss F. M.	14 Stourcliffe Avenue
1925	Little, J. T., M.A.	Yed Hill, Ringwood
1925	Little, Mrs.	,, ,,
1925	Little, Miss C. J.	,, ,,
1925	Little, Miss S. P., M.A.	,, ,,
1922	Littleboy, Miss E. S.	2 Bodorgan Manor, 30 Bodorgan Road
1923	Littlewood, Engineer Capt. A. W., R.N., retd., O.B.E., Chevalier Legion of Honour.	28 Princess Road
1922	Logan, T. T.	10 Argyll Road, Boscombe
1916	Logan, Mrs.	,, ,,
1922	Logan, Miss G. M.	,, ,,
1922	Logan, Miss S. M.	,, ,,
1930	Long, E. E., C.B.E.	6 Chine Crescent Road
1924	Longbottom, F. W., F.R.A.S.	Haslemere, Penrith Road, Boscombe
1928	Longbottom, Mrs.	,, ,, ,,
1920	ALove, W. J. E.	St. Clement's School House
1903	oLupton, Miss	2 Hengist Road
1909	†Lyon, Claude	Shalimar, Wilderton Road, Branksome Park
1910	Lyon, Mrs.	,, ,, ,,

M

1908	AMackay, Miss	8 King's Park Road
1929	Mackay, Miss C. J.	,, ,,
1931	Mackessack, Col. P., B.SC., M.B., CH.B., D.P.H.	Kinloss, East Avenue
1931	Mackessack, Mrs.	,, ,,
1909	McBean, Miss S.	St. Michael's, Buxton
1920	Male, H. C., M.D., M.R.C.S.	35 Irving Road, West Southbourne
1930	†*Malmesbury, The Rt. Hon. the Earl of, D.L., J.P.	Heron Court, Christchurch
1929	Marchant, Rev. Sir James, K.B.E.	Pine Garth, Buccleuch Road

1931	Marks, Lt.-Col. R. J.	Wilford, Overcliff Drive, Boscombe
1931	Marks, Mrs.	,, ,, ,,
1931	Marsh, W. H., B.SC. (Lond.)	Archways, Mount Pleasant, Ringwood
1917	Marston, Miss G.	Bourne Hall Hotel
1913	Martin, Miss F. G.	32 Southbourne Road
1914	Mate, S. J.	10 Landseer Road
1921	Mate, Mrs.	,, ,,
1918	Matthews, Mrs. J. P.	The Bungalow, Lascelles Road, Boscombe
1921	Mattocks, Mrs.	Meyrick Cliffs Hotel, Beacon Road
1925	Mattocks, C. G. B.	,, ,, ,,
1922	Mattocks, T. E. T.	,, ,, ,,
1930	Medwin, Miss G. L., M.B.E.	17 Ophir Road
1929	Meyrick, Sir George, BART.	Hinton Admiral, Christchurch
1930	Middle, Miss A. M.	East Cliff Hall
1931	Miles, Miss V.	21 King's Park Road
1930	Miller, Dr. A. H.	Branksea Tower, Osborne Road, Parkstone
1925	Miller, Miss B.	Sunnycroft, 15 Penrith Road, Boscombe
1926	Miller, Miss W. F., B.A.	,, ,, ,,
1930	Molineux, A. W.	Wendover, Manor Road, New Milton
1922	Moore, Major T. C., I.M.S.	Verwood, Dorset
1931	Morrell, C. Conyers, M.D. (Brux), L.R.C.S., L.R.C.P. (Edin.), D.P.H., F.R.I.P.H.,F.R.A.S.	Mudeford House, Christchurch
1931	Morrell, Mrs. I. C., M.R.I.P.H.	,, ,, ,,
1908†*	Morris, Sir Daniel, K.C.M.G., J.P., M.A., D.SC., D.C.L., LL.D., F.L.S.	Sunnyvale, Hawkwood Road
1911	Morris, Lady	,, ,,
1908	Moss, Miss	The Grange, 52 Westby Road
1929	Mott, Lady	4 Dingle Road
1924	Moulson, Miss R.	20 St. Stephen's Road
1928	Muspratt, Brig.-Genl. F. C., C.B., C.M.G.	44 Lansdowne Road

N

1925	Newman, Mrs. C. A.	Harewood, 17 Dean Park Road
1931	Nichols, Mrs.	Fanling, 58 Stirling Road
1931	Notcutt, E. A.	24 Southwood Avenue

O

1929	Ogden, Miss E.	Southland, Corfe Castle
1910	Oke, A. W., B.A., LL.M., F.G.S., F.S.A.	32 Denmark Villas, Hove, Brighton
1927	Oldham, H.	Holmesdale, 44 Browning Avenue
1920	Osborne, J. H.	Woodside, Kinson
1922	Ousby-Trew, Miss	Overthorpe, 19 Florence Road, Boscombe
1929	Owen, H., B.A., M.B., M.R.C.S.	59 Manor Road
1929	Owen, Mrs.	,, ,,
1929	Owen, J. D.	81 St. Luke's Road
1929	Owen, Miss E. D.	,, ,,
1929	Owen, Miss M. D.	,, ,,
1930	Owen, Mrs. G.	Leyswood, Crescent Road, Branksome Park

P

1904	Painter, Mrs.	29 Talbot Road
1919	Parker, Miss M.	The Cliff, 13 Southwood Avenue, W. Southbourne

1926	Parrott, F. W.	33 Heathwood Road
1928	Parry, Miss A. K.	Tilneyhirne, St. John's Road, Boscombe
1926	Parton, Miss E. C.	197 Holdenhurst Road
1926	Parton, Miss M. A.	,, ,,
1925	Paterson, Miss L., J.P.	Corfe Lodge, Parkstone
1926	Paterson, Miss M.	,, ,,
1926	Paterson, Miss N.	,, ,,
1924	Pattinson, Dr. T. W.	59 Wellington Road
1924	Pattinson, Mrs.	,, ,,
1924	Pells, J.	9 Stokewood Road
1913	†Penrose, F. G., M.D., F.R.C.P., F.Z.S., M.B.O.U.	Woodbury, 9 Grove Road, East Cliff
1916	Penrose, Mrs.	,, ,, ,,
1916	Penrose, Miss F.	,, ,, ,,
1916	Penrose, Miss M., B.SC.	,, ,, ,,
1912	Pestell, Miss	Engelberg, 92 Surrey Road
1930	APeter, A. J.	34 Avon Road
1931	Phelps, J. V.	Woodbury, East Avenue
1929	Phelps, Mrs.	,, ,,
1921	Phillips, Rev. C. A.	36 Dean Park Road
1921	Phillips, Miss C. E.	,, ,,
1920	Pilkington, Miss L. D.	The Steyne, 9 Manor Road
1927	APocock, Miss E.	67 Wentworth Avenue
1921	Pontifex, R. D.	Dalton House, 68 Christchurch Road
1920	Pontifex, Mrs.	,, ,, ,,
1921	Pontifex, G. K. D.	,, ,, ,,
1926	Potter, Rev. Prof. M. C., M.A., D.SC., F.L.S.	Corley Croft, York Avenue, New Milton
1930	Potter, Miss R. M.	5 Haslemere Road, London N.8
1930	†*Prain, Lt.-Col. Sir David, C.M.G., C.I.E., F.R.S.	The Well Farm, Warlingham, Surrey
1925	Price, L.	Oakwood, Harvey Road, Boscombe
1925	Price, Mrs.	,, ,, ,,
1918	Punch, Cyril	60 Wellington Road

Q

1922	Quick, R., F.S.A. (Scot.)	Russell-Cotes Art Gallery and Museum
1924	Quick, Mrs.	,, ,, ,, ,,
1930	Quick, Miss L.	,, ,, ,, ,,

R

1927	Raine, A. D.	Milverton, Lymington
1927	Raine, Mrs.	,, ,,
1912	Rankin, W. Munn, M.SC. (Leeds), B.SC. (Lond.)	Municipal College, Burnley, Lancs.
1920	*Elected an Honorary Member	
1917	Ranshaw, Miss E. M.	9 Marlborough Road
1918	Ratcliffe, Mrs.	Brooklands, 32 Branksome Wood Road
1930	Ravenhill, Miss M. F.	Eastry Court, Meyrick Road
1926	Rayner, Miss E.	Camelot, Watkin Road
1919	Rayner, Miss F.	,, ,, ,,
1905	*Rayner, J. F., F.R.H.S., M.B. MYC. S.	3 Cumberland Park, London W.3
1931	Read, Mrs. A. H.	16 Chester Road
1928	Rees, Miss C. St. B. M.	Invermay, Manor Road, Swanage
1927	Rees, Commandant S.J., F.R.G.S., J.P.	Branksome Lodge, 21 Avenue Road

1924	*Reid, Mrs. E. M., B.SC., F.L.S.	Pinewood, Milford-on-Sea
1928	Reid, Mrs. F. K.	Westminster Hall Hotel, West Cliff
1928	Reid, Miss F. A.	,, ,, ,,
1919	ARichards, Miss E. E., B.SC.	26 Poole Road
1928	Richards, Mrs. E. M.	17 Dunbar Road
1931	Richardson, Miss I. M.	Top Flat, 2 Milton Road
1927	Richey, H. A., B.A.	1 Brookside, Exeter Lane
1927	Richey, Mrs.	,, ,,
1926	Rix, Miss M. E. de B.	Wayside, Stourcliffe Avenue
1916	Roberts, H. Astley. B.A.	Shalvah, Wilfred Road, Boscombe
1918	Roberts, Mrs.	,, ,, ,,
1924	Roberts, Mrs. J.	Aysgarth, 16 Poole Road
1924	Robertson, W. G. A., M.D., D.SC., F.R.C.P., F.R.S. (Edin), F.S.A. (Scot.)	St. Margaret's, St. Valerie Road
1929	Robinson, Miss M. H.	14 Talbot Avenue
1929	Robinson, Miss W. A.	,, ,,
1928	Robson, Alderman H., J.P.	Mulgrave, Meyrick Park Crescent
1923	Roden, Miss E. M.	14 Campbell Road, Boscombe
1905	Rogers-Barns, Miss	Vergers Mead, Corfe Castle
1914	Rooke, Miss S. G.	Norbury, 53 Paisley Road
1914	*Roper, Miss Ida M., F.L.S.	4 Woodfield Road, Redland, Bristol
1922	Rosling, Mrs.	12 East Avenue
1916	Rothwell, Mrs.	21 Wentworth Avenue, West Southbourne
1925	Ruddle, Mrs. F. J.	12 Richmond Park Crescent
1913	Russell-Cotes, H. V. M.	8 Meyrick Park Crescent

S

1926	Sale, G.	Fixby, Milner Road
1926	Sale, Miss L.	,, ,,
1926	Sale, Miss M.	,, ,,
1926	Sale, V. M.	,, ,,
1929	Saunders, Mrs. M. S.	Charlton House, Bradburne Road
1919	Savage, J. W.	41 Wentworth Avenue, West Southbourne
1927	Sayle, G. M.	Malvernbury, Watcombe Road
1929	Sayle, Miss P. P.	,, ,,
1915	Scholes, Mrs.	Aldourie, Branksome Wood Road
1922	Scholes, R. D.	,, ,,
1922	Scholes, Miss V. O. M. D.	,, ,,
1926	Scollick, Mrs.	Eglantine, Budleigh Salterton, Devon
1929	†*Scott, Dukinfield H., M.A., LL.D., F.R.S., F.G.S., F.L.S.	East Oakley House, Basingstoke
1919	Scott, G. B., C.I.E.	Glencoy, 80 Surrey Road
1903	oScott, J. H., M.E., M.I.M.C.E.	Kirkby, 22 Linwood Road
1916	ASeeviour. G. C., A.C.P., F.R.H.S.	St. Peter's School House
1926	Shann, W. A., M.B.	27 Grand Avenue
1914	Sharp, C.	Langdon, Parkstone
1919	Sharp. Miss E.	,, ,,
1919	Sharp, Miss F.	,, ,,
1930	Shaw, Rev. Courtney A.	The Dormy Hotel, Ferndown
1927	Sherrard, Miss L. J.	Royal Bath Hotel
1907	Sherring, Miss O. L.	Hallatrow, near Bristol
1926	Shipman, Lt.-Col. H. J.	28 Surrey Road
1916	Simpson, Rev. E. J. Douglas, M.A.	Maesbury, 3 Cavendish Road
1920	Simpson, N. Douglas, B.A., F.R.M.S., F.L.S.	,, ,,
1925	Smith, H. H.	9 Cambridge Road
1926	Smith, Mrs.	,, ,,

1918	Smith, Horace, M.A., M.D.	Sunnyhurst, 7 Dean Park Road
1914	Smyth, W. Johnson, M.D.	Killalief, 534 Holdenhurst Road
1922	Smyth. Miss M.	,, ,,
1915	Smythe, Mrs.	Willstead, 22 Cavendish Road
1920	Smythe, Miss D.	,, ,,
1916	Smythe, Miss K. M.	,, ,,
1919	Snell, S. H., M.D., M.B.O.U.	1 Portman Crescent
1919	Snell, Mrs.	,, ,,
1922	Speakman, Mrs. E.	13 Milton Road
1931	Spencer, C.	51 Alum Chine Road
1909	Spencer, J. F.	Glenthorne, 73 Richmond Park Road
1923	Stables, A. D.	Saxthorpe, St. Osmund's Road, Parkstone
1923	Stables, Mrs.	,, ,, ,, ,,
1926	Standring, J.	Naseby Nye, Byron Road, Boscombe
1926	Standring, Mrs.	,, ,, ,,
1923	Starr, Col. W. H., C.B., C.M.G., C.B.E.	4 Foxholes Road, Southbourne
1931	Stephens, Miss S.	21 Albermarle Road
1928	Stiff, Miss F. M.	Grosvenor Hotel, Chine Crescent
1929	Stiff, Miss M. I.	,, ,,
1916	Stiff, S. J., B.SC.	Norden House, Corfe Castle
1916	Stiff, Mrs.	,, ,,
1916	Stiff, Miss M. J.	,, ,,
1928	Stone, Miss E. J.	7 Strouden Avenue
1929	Stone, Miss M. A.	,, ,,
1920	Stoney. Miss F. A., O.B.E., M.D., B.S.	12 Burnaby Road
1924	Story, F. N.	Storyland, Church Road, Southbourne
1924	Story, Mrs.	,, ,, ,, ,,
1930	Stubbs, Miss A.	Tower House, West Cliff Gardens
1918	G†*Sumner, Heywood, F.S.A.	Cuckoo Hill, South Gorley, Fordingbridge
1928	Sutherland, W.	Silverdale, 20 Penn Hill Avenue, Parkstone
1928	Sutherland, Mrs.	,, ,, ,,
1906	Swallow, E.	York Cottage, Ravine Road, Canford Cliffs
1930	Swetenham, Mrs. E. B. L.	63 Overcliff Drive, Southbourne
1931	Sworder, Miss E. G.	193 Bournemouth Road, Parkstone
1922	ASymes, H., M.A.	52 Lowther Road

T

1911	Tatchell, Leonard, F.E.S.	Swanage,
1931	Tatlow, Mrs. E. M.	70 Southbourne Road
1916	Taylor, Mrs.	Claregarth, Montague Road, W. Southbourne
1916	Taylor, Miss M. W.	,, ,, ,, ,,
1928	Taylor, Mrs. R. A.	17 Dunbar Road
1929	Taylor, Miss N. G. R., M.A.	,, ,,
1923	Thill, Mrs.	8 Colville Road, Boscombe
1925	AThomasson, Miss M. E.	37 Belvedere Road
1928	Thompson, Rev. J. C., F.G.S.	Cragside, Manor Road, New Milton
1929	Thomson, A. G. A., M.A., M.B.	38 Wentworth Avenue, Boscombe
1922	Thomson, A. W. Ferguson	Ailsa, Erpingham Road
1911	Thomson, Mrs. Roberts	Monkchester, 17 Manor Road
1928	Thornton, Mrs. Sykes	Moorland Court, Queen's Park West Drive
1919	Thoroton, Rev. L. E. W.	Hill House, Spencer Road, Canford Cliffs
1911	Tickell, Miss S. M.	Capri, 90 Richmond Park Avenue
1931	Towner, H. V., A.M.I.C.E.	14 Southwood Avenue
1931	Towner, Miss E.	,, ,,
1931	Towner, Miss M.	,, ,,

1931	Trotter, Miss E., C.B.E.	4 East Avenue
1929	Tucker, Mrs. E. M.	39 Hamilton Road
1911	Turner, J. E.	Bramley, 94 Surrey Road
1914	Twemlow, Miss E. E.	Devon Lodge, 83 Alumhurst Road

V

1913	Veale, Miss A. G.	14 Cecil Avenue
1918	Vorse, John	Leighurst, Walkford, Christchurch

W

1931	Wade, Miss E. M.	13 Alumdale Road
1924	Wadlow, H. J.	The Gables, Queen's Grove, Parkstone
1916	Walby, A. E.	Netherton, 2 Dean Park Road
1921	Wales, Miss	The Nook, 4 Ormonde Road, Branksome Park
1921	Wales, Miss N.	,, ,, ,, ,,
1918	Walker, R. S.	Meyrick Cliffs Hotel
1913	Wallace, W. G.	Doveshill Cottage, Ensbury Park
1931	Wallace, Mrs. F. E.	23 Prince of Wales Road
1912	Walter, Mrs. G. P.	Rusholme, 10 St. Anthony's Road
1920	Wanstall, W. S.	Del Monte, 6 Roslin Road
1920	Wanstall, Mrs.	,, ,,
1928	Watson, Miss E. M.	20 Southwood Avenue
1930	Webb, Mrs. F. J.	6 St. Anthony's Road
1928	AWebber, A. E.	28 Tower Road, Boscombe
1928	Welfitt-Nicholls, Miss C.	Dudbrooke House, Eardley Road, Sevenoaks
1913	Wetherell, Miss M.	Triana, 21 Harvey Road, Boscombe
1920	Wetherell, Miss S.	,, ,, ,, ,,
1918	Whitaker, S.	22 Somerset Road, Boscombe
1930	Whitaker, Mrs.	,, ,, ,,
1924	Whitaker, Miss E. M.	Roseways, Frinton-on-Sea.
1924	Whitaker, S. E., M.S.A.	22 Selwood Road, Addiscombe, Croydon
1920	White, J. R., M.A.	Whitecot, 15 Linwood Road
1931	White, S. J.	7 Gilbert Road
1929	Whiteley, F. W.	7 Charminster Road
1927	Wigmore, A. J., B.A., M.R.C.S., L.R.C.P.	Aymestrey, Tuckton Road, Southbourne
1927	Wigmore, Mrs.	,, ,, ,,
1927	Wigmore, Miss	,, ,, ,,
1931	Wilkes, G. H.	White Hills, Penn Hill Avenue, Parkstone
1931	Wilkes, Mrs.	,, ,, ,,
1919	Williams, John	Brynmill, 68 Southcote Road
1926	Williamson, H. J.	Quiddington, Birchwood Road, Parkstone
1924	AWillis, Miss G. H.	116 Paisley Road, West Southbourne
1929	Windsor, Mrs. E.	Craigside, Manor Road, New Milton
1920	Woodhouse, Rev. A. P.	Deanhurst, 5 Littledown Road
1903	oWoodhouse, W. J., A.C.P., M.I.H.	35 Chatsworth Road, Malmesbury Park
1918	Woodhouse, Mrs.	,, ,, ,,
1923	Woodhouse, W. R.	,, ,, ,,
1923	Woodhouse, Miss M. M.	,, ,, ,,
1931	Woods, J. C.	Pine Croft, Rothesay Road
1931	Woods, Mrs.	,, ,,
1930	†*Woodward, Sir A. Smith, F.R.S., F.L.S., F.G.S.	Hill Place, Haywards Heath, Sussex

Y

1924	Yates, Rev. A. G., M.A., R.N.	14 Wellington Road
1924	Yates, Mrs.	,, ,,
1924	Yates, Miss E. M. M.	,, ,,
1929	Young, H. T.	11 Borthwick Road, Boscombe
1929	Young, Miss E.	,, ,,

RULES OF THE
Bournemouth Natural Science Society.

(*As amended, October,* 1931.)

Title

1.—The title of the Society shall be THE BOURNEMOUTH NATURAL SCIENCE SOCIETY.

Objects

2.—The objects of the Society shall be:

(*a*) The promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, the formation of Sections of its members devoted to any particular branch of the Society's work, and in any way that the Council of the Society shall deem advisable.

(*b*) The making of reports on any animal, plant, or object of interest, and the carrying out of the recommendations contained in such reports.

Members

3.—The Society shall consist of Ordinary, Life, Honorary and Associate Members.

Ordinary Members

4.—Ordinary Members shall pay an Annual Subscription of One Pound, due on the first day of October in each Year. The inclusive Annual Subscription for Adult Members of the same family, not exceeding four and residing in the same house, shall be Two Pounds, each Member being elected in the usual manner and each receiving a card of membership. Persons living outside a radius of six miles from the Square at Bournemouth may be elected Country Members, and pay one half the above rates of subscription.

Life Members

5.—The Subscription for Life Members shall be Ten Pounds. Any Ordinary Member who shall have commuted his Subscription, as provided for in this Rule, shall become a Life Member, but shall not by reason thereof have any rights differing from those of an Ordinary Member.

¶ Rules 5a and 5b referred to in the Trust Deed are Rules 19 and 20.

Honorary Members

6.—Any person distinguished in Science or who has rendered any special service to the Society, may be elected an Honorary Member. Honorary Members shall be proposed and elected in the same way as Ordinary Members. The number of Honorary Members shall be limited to twenty-five.

Associate Members

7.—Persons may be admitted Associate Members by the Council on account of their scientific attainments or because they are likely to prove useful working Members of the Society. This privilege will usually be granted to School Teachers.

The annual subscription for Associate Members shall be seven shillings and sixpence. They shall be entitled to all the privileges of Membership except that they shall have no power of voting on the affairs of the Society or of holding office.

Proposal and Election of Members

8.—The Ordinary, Life, and Associate Members of the Society shall be proposed by a Member to whom they are known personally or to whom they have presented adequate credentials, and seconded by another Member, and the proposal, in the form following these Rules, shall be sent to the Honorary Secretary. The name of any such proposed new Member shall be posted on the Notice Board of the Society for a period of not less than seven days, after which such name shall be voted upon at the next ensuing Council Meeting, and if two-thirds of the Council present and voting shall vote for the proposed New Member, such Candidate shall become a Member upon payment of the Annual Subscription and shall receive a Card of Membership which is not transferable. Any Member joining during August or September shall receive a Card of Membership to September 30th of the following year without further payment.

Unpaid Subscriptions

9.—Any Members whose subscriptions are unpaid at the end of the financial year (September 30th), after notice in writing to that effect has been given to them by the Honorary Treasurer, shall be reported to the Council, which shall have the power of removing their names from the list of members.

Resignations

10.—Resignations must be in writing and addressed to the Honorary Secretary. Members are liable for all subscriptions which may have fallen due prior to the date of resignation.

Executive Officers.

11.—The Executive Officers of the Society shall be the Chairman of Council, the Deputy Chairman of Council, Honorary Treasurer, and Honorary Secretary.

The President

12.—The President shall be elected annually and need not necessarily be selected from Members of the Society. He shall be invited to deliver an Address at as early a date in the Winter Session as can be arranged.

Vice-Presidents

13.—Any Member of the Society who, in the opinion of the Council, has rendered distinguished service to Science or to the Society, shall be eligible for election as a Vice-President at the Annual Meeting and, if elected, shall retain office as long as he remains a Member of the Society.

Chairman of General Meetings

14.—The President or a Vice-President shall take the Chair at all General Meetings other than the Annual and Special Meetings. At these the Chairman of Council or Deputy Chairman shall preside.

Honorary Secretary

15.—The Honorary Secretary shall perform all the usual secretarial work, shall keep minutes of all Council Meetings, and of the Annual and Special Meetings, and make a synopsis of all other General Meetings. He shall cause the agenda of the Annual and Special Meetings to be sent to every Member seven days at least before each such Meeting. He shall make all preparations for General Meetings and General Excursions, in respect of which he shall collect from each Member his share of the expenses, and therefrom defray all costs of the Meetings or Excursions.* Any surplus of such collections shall go to the General Fund, and any deficit be defrayed out of that Fund. He shall keep an account of all out-of-pocket expenses. He shall give notice of their election to all new members, and register the Sections, if any, to which they ask to belong. He shall furnish copies of the Annual Reports published during their membership, to all Members who have paid their subscriptions, the number of copies of the " Proceedings " supplied in respect of each family subscription shall not exceed two; to Honorary Members, and to such Scientific Societies as the Council may from time to time appoint to receive them.

*Note.—Tickets may be returned and the money refunded up to the expiration of the time for taking tickets for any Excursion; after that date, no money can be refunded even if the tickets are not used.

Honorary Treasurer

16.—The Honorary Treasurer shall have the custody of the General Funds of the Society. He shall receive and acknowledge all Subscriptions, and shall issue tickets of Membership to all persons who are duly elected and have paid their Subscriptions. He shall bring before the Council any accounts that are due for payment. He shall prepare a financial Statement at the end of each Financial Year to be presented to the Council at the Meeting next preceding the Annual Meeting. After presentation of the Financial Statement to the Council, he shall submit it to the Auditors and lastly to the Annual Meeting of the Society.

Council

17.—There shall be a Council of the Society consisting of the Vice-Presidents who have filled the office of President, the Honorary Treasurer, the Honorary Secretary, the Honorary Librarian, the Honorary Editor, the Honorary Curator, the Chairmen of Sections, not more than ten Members elected by the Society and not more than two co-opted Members.

Council

18 (*a*).—The Council shall have the general management of the Society and the control of its funds. At all Meetings of the Council, five shall form a quorum. The Council shall elect its own Chairman and Deputy Chairman for the Year, shall have power to fill up vacancies in its number, and to co-opt not more than two additional members. The Council shall have power to appoint Committees to deal with any business that may be delegated to them.

(*b*) The Chairman, or in his absence the Deputy Chairman, shall have an original and a casting vote at all Meetings of the Council.

(*c*) The Council shall arrange all Lectures, Papers, Demonstrations and Exhibitions of Specimens, etc., for the General Meetings and Excursions of the Society, and shall approve of all arrangements for Sectional Meetings and Excursions before they are included in the monthly programme.

(*d*) If any elected or co-opted member of the Council shall fail to attend four consecutive Meetings of the Council, his seat shall become vacant unless the Council shall decide otherwise.

Trustees

19.—The property of the Society shall be vested in Trustees who shall be elected by the Council. The number of Trustees shall be not more than nine or less than three, and they shall respectively hold office until death or resignation, unless removed from office by a resolution of the Council. The Trustees shall from time to time deal with the property of the Society as directed by resolution of the Council (of which an entry in the minute book shall be conclusive evidence), and they shall be indemnified against all liability whatsoever out of the property for the time being of the Society.

¶ This Rule is referred to in the Trust Deed as Rule 5a.

Borrowing Power

20.—If at any time the Society in general meeting shall pass a resolution authorising the Council to borrow money, the Council shall thereupon be empowered to borrow for the purposes of the Society such amount of money, either at one time or from time to time, and at such rate of interest, and in such form and manner, and upon such security as shall be specified in such resolution, and thereupon the Trustees shall make all such dispositions of the property of the Society or any part thereof, and enter into such agreements or arrangements in relation thereto, as the Council may by resolution direct for giving security for such loan or loans and interest thereon at the agreed rate. All members of the Society, whether voting on such resolution or not, and all persons becoming members of the Society after the passing of such resolution shall be deemed to have assented to the same as if they had voted in favour of such resolution.

¶ This Rule is referred to in the Trust Deed as Rule 5b.

Visitors

21 (*a*).—A Member may introduce friends who accompany him to all parts of the Society's premises except those which are let or in use for a Lecture or Meeting. The Member must enter the names and addresses of such Visitors in the Visitors' Book and sign the entry. Strangers cannot be admitted on presenting a Member's card or letter.

(*b*) A Member may introduce two Non-Members, who accompany him, to any Lecture or Excursion of the Society, but no Non-Member may be thus introduced to more than two Lectures in the Winter Session and two Excursions in the Summer Session, even though introduced by different Members. In the case of Lectures, the introducing Member must enter the names and addresses of the Visitors in the Visitors' Book and sign the entry. In the case of Excursions, the introducing Member must send the names and addresses to the Organiser of the Excursion.

(*c*) A Member introducing a Visitor is responsible for ascertaining that the Visitor has not been introduced twice previously in that Session and also that the privilege is not used for commercial purposes.

(*d*) A Visitor to Bournemouth may, with the approval of the Council, be granted a ticket enabling him to attend the Meetings and Excursions of the Society for a period not exceeding six months at a charge of Fifteen Shillings.

(*e*) The Council shall have power to extend the hospitality of the Society to distinguished Visitors.

(*f*) The Council shall have power temporarily to alter or suspend this Rule or any part of it.

NOTE.—Nothing in this Rule shall prevent the Chairman of a Section from introducing, at any time, a non-member who offers a communication of interest to his Section.

Charges for Meetings

22.—The Council shall have power to make a charge to Members for admission to any Meeting the holding of which involves special expenses, and may arrange for the admission of Non-Members.

Expulsion

23.—The power of expulsion of a Member from the Society for objectionable conduct shall be vested in the Council and exercised at a Special Meeting called for that purpose. Notice of the proposed expulsion must be given on the circular convening the Meeting. The expulsion must be carried by a majority of two-thirds of those present.

The Member affected shall have power to appeal to a General Meeting of the Society to act by the like majority.

Annual and Special Meetings

24 (*a*).—The Annual Meeting shall be held in the month of October.

(*b*) At this Meeting the President, the Chairmen of Sections, the Honorary Treasurer, the Honorary Secretary, the Honorary Librarian, the Honorary Editor, the Honorary Curator, not more than ten Members of the Council and two Auditors for the ensuing year shall be elected, either Auditor having the power to audit the accounts in the absence of the other.

(*c*) At this Meeting the Council's Report for the past year, and the Honorary Treasurer's statement of accounts duly signed by the Auditors, shall be submitted.

(*d*) Notice convening an Annual or Special Meeting, together with the agenda and details of any proposed alterations in the Rules, shall be given to Members at least seven clear days before such Meeting is held. Notice of General Meetings shall be given at least seven clear days beforehand.

(*e*) On a written Requisition, signed by at least ten Members of the Society, the Council shall call a Special Meeting to consider any question as to the affairs of the Society, such Meeting to be called within three weeks of the Council Meeting next following the receipt by the Honorary Secretary of the Requisition, and at least seven clear days' Notice shall be given to the Members. At such Meeting no other business than that mentioned on the Requisition, and on the notice convening such Meeting, shall be considered.

(*f*) At the Annual Meeting and at all Special Meetings of the Society, not less than twenty-five Members shall form a quorum.

Sections

25 (*a*).—The Council shall have power to form a Section for the study of any special subject deemed within the scope of the Society's work, and shall appoint the Chairman for the first year.

(*b*) The Chairman of each Section shall appoint a Secretary for the Section, who, in addition to the ordinary secretarial duties, shall keep a list of the Members of the Section.

(*c*) A Section shall consist of those Members who have given notice, in writing, of their wish to be registered as members of the Section, either to the Honorary Secretary or to the Honorary Secretary of the Section. Such registration will not become effective until the expiration of a fortnight from the date that the notice is received.

(*d*) The Members of each existing Section shall, at a Meeting held before the last week in July in each year, nominate the Chairman of the Section for the ensuing year to come into office after the Annual Meeting. The Secretary of the Section shall send such Nomination to the Honorary Secretary in time to present it at the Council Meeting held on the last Monday in July.

(*e*) If the Council approve of the Nomination, it shall recommend the person nominated for Election at the Annual Meeting, otherwise it shall refer the matter back to the Section. In the event of a Section failing to nominate a Chairman, the Council shall have the right to do so. The final Election shall take place at the Annual Meeting.

(*f*) At the request of the Sectional Chairman the Secretary of a Section may attend Meetings of the Council, but without the power of voting.

(*g*) Each Sectional Chairman shall be responsible for the preparation and arrangement of each Sectional Meeting and Excursion, and shall furnish details of the same to the Honorary Secretary for submission to the Council. At the end of each Session he shall render to the Honorary Treasurer an account of his receipts and payments for the Section.

NOTE.—As under Rule 15.

(*h*) A Minute Book for each Section shall be kept in which shall be entered details of the Section's work and an account of all Sectional Meetings, with the number of Members attending and notes on any matters of interest observed or discussed. Such book shall be submitted to the Council whenever required. The Chairman of each Section shall send to the Honorary Secretary a report of the Section's work for the year in time for it to be epitomised in the Council's Report to the Annual Meeting.

Alteration in Rules

26.—Alterations in the Rules must be sanctioned by a majority of not less than two-thirds of the Members present and voting at the Annual Meeting, or at a Special Meeting called for that purpose, and no alterations shall otherwise be made.

To the Honorary Secretary,

Bournemouth Natural Science Society,
39, CHRISTCHURCH ROAD, BOURNEMOUTH.

Dear Sir,

I beg to propose that

M..

(Please give Christian name in full, and state title—Mr., Mrs., Miss, etc., and any degrees or qualifications.)

Address..

....

**who is personally known to me*
**who has produced satisfactory credentials to me* *be elected an* **Ordinary* / **Associate*
Member of the Society.

Date.................. *Member's Signature* ....

I beg to second the above proposal

Date.................. *Member's Signature*..................................

*Delete word not applicable. See extract from Rules on reverse of this form.

Annual Meeting, 1931.

THE twenty-eighth Annual Meeting was held on Saturday, October 24th, at 3 p.m., the chair being taken by the Rev. C. O. S. Hatton.

The Minutes of the last Meeting were read and approved.

The Council's Report for the year was adopted on the proposal of Mr. Bury, seconded by Rev. E. J. D. Simpson, and the Statement of Accounts was passed on the proposal of Dr. Morrell, seconded by Mr. Quick.

A cordial vote of thanks to the retiring President, Mr. Henry Bury, was moved by Dr. Crallan, seconded by Mr. Lyon, and carried. The election to the vacant office of Dr. Dukinfield Scott, who has already filled the post some 21 years ago, having been proposed by the Chair and seconded by Mr. Beeching Hall, was carried by universal consent. There followed the re-election of Officers, proposed by Mr. Richey and seconded by Miss Fryer, the election of Chairmen of Sections, proposed by Dr. Robertson and seconded by Miss S. Wetherell, and of 10 unofficial members of the Council, after a ballot among 13 candidates.

The Honorary Auditors were thanked for their services and their re-election was proposed by Col. Dundee, seconded by Mr. Hayes Barratt, and carried.

A special vote of thanks to all members who have helped the Society in various departments was carried on the proposal of Col. Anderson, seconded by Rev. E. Horne.

An alteration of some importance in Rule 25 clause (c) was submitted on behalf of the Council, and, after a spirited discussion, was carried by a large majority.

On the proposal of the Chair, seconded by Mr. Quick, the names of Mr. Bury and Rev. A. G. Yates were added to the list of Vice-Presidents; and, on the motion of Mr. John Williams, seconded by Dr. Potter, a very hearty vote of thanks was accorded to the Chairman, not only for his able conduct of the Meeting, but for his invaluable services to the Society during the past year.

Council's Report, 1931.

THE Council has pleasure in presenting its Twenty-eighth Annual Report.

Our Members now number 577, including 18 Honorary Members, 19 Associate Members, 7 Original Members, 12 Past Presidents.

During the past year there have been held:—

Annual Meeting
Presidential Address
23 General Meetings
6 ,, Excursions
70 Sectional Meetings
38 ,, Excursions

GENERAL.

Lectures and Meetings.

(*Illustrated by Lantern Slides.)

1930.	
Oct. 25.	Annual General Meeting.
Oct. 28.	Club Day.
Nov. 1.	Presidential Address.
Nov. 10.	Club Day.
Nov. 14.	Informal Evening Meeting.
Nov. 28.	Informal Evening Meeting.
Dec. 3.	Club Day.
1931.	
*Jan. 2.	Children's Lecture. Claude Lyon.
Jan. 12.	Informal Evening Meeting.
Jan. 26.	Club Day.
Feb. 4.	Informal Evening Meeting.
Feb. 16.	Club Day.
Mar. 4.	Evening Meeting. "The South Pole," S. J. White. "Bones," Bernard Gorton.
Mar. 10.	Club Day.
*Mar. 24.	"The Wild Life of Africa, and its Preservation," Major R.W. G. Kingston.
Apr. 13.	Club Day.
May 6.	Evening Meeting.: "A Talk on Teeth." Bernard Gorton.
May 8.	Club Day.
June 10.	Evening Meeting. "Protective Colouring in Nature," R. K. Cardew. "Wild Animals in Captivity," Bernard Gorton.
June 22.	Club Day.
July 8.	Informal Evening Meeting.
July 21.	Club Day. (Nomination of Chairmen of Sections.)
Aug. 6.	,,
Sept. 22.	,,
Oct. 21.	,,

Excursions and their Leaders.

1931.
May 14. Bingham's Melcombe. J. Hayes Barratt.
June 18. Brympton D'Evercy. Rev. C. O. S. Hatton.
July 29. The Vyne, and the Church of St. Andrew, Sherborne St. John. J. Hayes Barratt.
Aug. 13. Winchester; St. Cross; Winchester College and Wolvesey Castle Ruins. Rev. C. O. S. Hatton.
Sept. 11. S.S. "Empress of Britain" at Southampton. E. Dodshon.
Sept. 30. Bladen Dairies. R. K. Cardew.

SECTIONAL.

Archæological and Historical Section.

Lectures and Meetings.

1930.
Nov. 27. "The discovery of a large fragment of Mammoth Tusk (Elephas primigenius) in the Avon Valley drift-gravel at Ibsley." Heywood Sumner.
*Dec. 15. "Some Archæological Finds around Bournemouth." J. B. Calkin.
Dec. 17. "Lymington." E. Hapgood.
1931.
Jan. 12. "The Ladies of Romsey." R. M. Fanstone.
Jan. 24. "Hill Forts." Dr. Williams Freeman.
Feb. 10. "Highcliffe Castle." Mrs. Gould.
Feb. 18. "The History of Poole." Alderman H. S. Carter.
Mar. 3. "Herodotus and Persian History." R. K. Cardew.
*Mar. 7. "Architecture of the 13th Century." S. E. Whitaker.
Mar. 30. "Scratch Dials." Col. E. B. Anderson.
Oct. 29. "Ancient and Modern Bridges." R. Quick.

Excursions and their Leaders.

May 15. Poole and Hamworthy. R. K. Cardew.
June 9. Corfe and Wareham. R. K. Cardew.
July 17. Martin, Rockbourne and Damerham. Col. E. B. Anderson and S. Whitaker.
Aug. 18. Preston and Chalbury Camp. R. K. Cardew.
Sept. 3. Rockbourne Down. Heywood Sumner and L. Beeching Hall.

Astronomical Section.

Lectures and Meetings.

1930.
*Nov. 22. "Star Conflagrations." J. Arthur Formoy.
*Dec. 6. "Some thoughts on the Association of Astronomy and Photography." F. W. Longbottom.
1931.
*Jan. 3. "Vagrant Astronomy." Dr. W. H. Steavenson.
*Mar. 18. "A Chat on the 3 Lesser Planets: Mercury, Venus and Mars." J. Thornton Burge.

Botanical Section.

Lectures and Meetings.

1930.
*Nov. 6. "The Life History of the Charophytes." James Groves.
*Nov. 25. "Byways in Egypt and the Sudan." N. Douglas Simpson.
*Dec. 11. "Respiration in Plants and Animals." Henry Bury and L. Beeching Hall.

1931.	
Jan. 20.	"Plants seen in 1930." L. Beeching Hall.
*Feb. 13.	"Wild Flowers in their Natural Colours and Surroundings." Col. Theodore Green.
*Mar. 14.	"The Woad Plant." A. R. Horwood.
Mar. 26.	"Plant Notes and Queries." A discussion, opened by Rev. C. O. S. Hatton.
Sept. 2.	"At Home."

Excursions and their Leaders.

1931.	
Apr. 23.	Hinton Admiral. J. Vorse.
Apr. 30.	Hinton Martell and Chalbury. R. K. Cardew.
May 5.	Brockenhurst. J. Vorse.
May 12.	Wareham. L. Beeching Hall.
May 19.	Townhill Park Gardens. Rev. C. O. S. Hatton.
May 28.	Verwood. Major T. C. Moore.
June 4.	Whitsbury. Miss M. Penrose.
June 11.	Shillingstone. Miss M. E. Curme.
June 16.	Corfe. Miss E. Ogden.
June 25.	Fordingbridge. Miss D. M. Ellen.
July 9.	Wool. H. J. Wadlow.
July 13.	Milford, for Keyhaven. L. Beeching Hall.
July 23.	Studland. L. Beeching Hall.
July 28.	Brockenhurst. H. J. Wadlow.
Aug. 11.	Avon to Christchurch via Hurn. Miss S. G. Rooke.
Aug. 21.	Spetisbury. R. K. Cardew.
Aug. 27.	Wootton, for Marlborough Deep. Rev. C. O. S. Hatton.
Sept. 3.	Rockbourne Down. L. Beeching Hall and Heywood Sumner.
Sept. 8.	Downton. Miss Marcia Penrose.
Sept. 15.	Wool. Miss S. Wetherell.
Sept. 24.	Wareham. L. Beeching Hall.
Oct. 1.	Corfe, for Creech Barrow. H. J. Wadlow.
Oct. 8.	Hinton Admiral. (Fungus Foray.) Rev. C. O. S. Hatton and J. Vorse.
Oct. 13.	Brockenhurst. (Fungus Foray.) Rev. Professor M. C. Potter and J. Vorse.
Oct. 22.	Dudsbury. R. K. Cardew.

Entomological Section.

Lectures and Meetings.

1930.	
Nov. 30.	Inspection of the Collection of Indian Lepidoptera presented by Lieut. Ewbank.
1931.	
Jan. 6.	"The Family Mombycidae, order Lepidoptera." Dr. G. E. J. Crallan.
Feb. 17.	Exhibition of Objects of Interest.
Mar. 17.	"The Habits of some Indian Butterflies." Miss K. M. Chilver.
Apr. 21.	Exhibition of Objects of Interest.
Oct. 20.	" " "

Excursion and Leader.

1931.	
June 13.	Hengistbury Head. A. E. Webber.

Geographical Section.

Lectures and Meetings.

1930.	
*Nov. 15.	Travel Talk. Alderman Henry Robson.
*Dec. 8.	"How London Tube Railways are made." Claude Lyon. (Lecture lent by the Underground Railways.)

1931.
*Jan. 10. "Ur and Babylon." Col. H. E. Crocker.
*Jan. 31. "Syria and Palestine." Col. H. E. Crocker.
Feb. 5. "Beautiful Mediæval Nürnberg." Miss Lucy Fairbrother. Illustrated by an Epidiascope.
*Mar. 9. "The Aborigines of the Malay Peninsula." Edward E. Long.
*Apr. 18. "Bournemouth in the Past and Present." W. J. Woodhouse.
May 2. "At Home."

Excursions and their Leaders.

1931.
May 20. Yeovil. Claude Lyon.
June 12. Trent and Sherborne. Claude Lyon.
July 7. Wookey Hole and Wells. Claude Lyon.

Geological Section.

Lectures and Meetings.

1930.
*Dec. 4. "Fossils and Evolution." Henry Bury.
1931.
*Feb. 28. "Lakes, Old and New." Dr. A. J. Wigmore.
*Mar. 12. "The Work of Water, Snow and Ice." Rev. J. C. Thompson.
*Apr. 25. "Fossils." Dr. G. E. J. Crallan.
Oct. 27. "The Geology of the Bournemouth District." Henry Bury.

Excursions and their Leaders.

1931.
June 2. Swanage and Studland. R. K. Cardew.
July 15. Ringstead Bay and Osmington Mills. Henry Bury.
Sept. 10. Hengistbury Head. Henry Bury.

Microscopical Section.

Lectures and Meetings.

1930.
Nov. 20. Exhibition of Objects of Interest. (Objects under top light.)
Dec. 18. ,, ,, ,, (Some seasonable sections.)
1931.
Jan. 15. ,, ,, ,,
Feb. 19. ,, ,, ,,
Mar. 19. ,, ,, ,, (Slides of Foraminifera.)
Apr. 16. ,, ,, ,, (Pond Life and Photomicrography.)
May 21. ,, ,, ,,
July 16. ,, ,, ,,
Aug. 20. ,, ,, ,,
Sept. 17. ,, ,, ,,
Oct. 15. ,, ,, ,,

Photographic and Record Section.

Lectures and Meetings.

1931.
*Jan. 28. "Gloucester Cathedral." S. Whitaker.
*Feb. 7. "Peregrinations in Pembrokeshire," (Part II). H. J. Williamson.
*Mar. 28. "Exhibition of Members' Work during 1929 and 1930."
*Apr. 4. "Amateur Photographer" Prize Slides.

Excursions and their Leaders.

1931.
July 17. Martin, Rockbourne and Damerham. S. Whitaker.
Aug. 26. Portchester Castle and Titchfield Abbey. S. Whitaker and E. Dodshon.

Physical Section.

Lectures and Meetings.

1930.
*Nov. 29. " Carbon in Relation to Life." Miss Marcia Penrose.
1931.
*Feb. 26. " Origin, Manufacture and Uses of Paper." Dr. G. E. J. Crallan
*Mar. 6. " Public Supply of Electricity." Edgar L. Ingram.
*Mar. 21. " Some Early Alchemical Investigators." Dr. M. Nierenstein.
May 30. " At Home."
A paper on " The Chemistry of Milk," by Miss S. J. Ingram.
*Oct. 31. " The Discovery of Mercury Helide." J. J. Manley. (Postponed from January).

Zoological Section.

Lectures and Meetings.

1930.
Nov. 19. " Sidelights on the Evolution Problem, from the study of Cuckoos' Eggs." Rev. F. C. R. Jourdain.

1931.
Jan. 22. " Zoological Specimens in the Museum." Bernard Gorton.
Feb. 24. Notes on " Bones." Bernard Gorton.
Mar. 31. Notes on " Articulations." Bernard Gorton.
Apr. 27. " Skulls, Horns and Teeth." H. H. Haines.
May 26. " The Domestic Animals." Bernard Gorton.
June 23. " Medicinal Substances of Animal Origin." Bernard Gorton.

Excursion and Leaders.

1931.
May 16. Conchological Ramble round Wick.
E. St. John Burton and Rev. C. O. S. Hatton.

The Council has much pleasure in announcing that Dr. Dukinfield Scott has kindly consented to be nominated as the President of our Society for the coming year. Dr. Scott was President for the year 1910-1911.

At the Council Meeting in November, 1930, it was decided that all Past Presidents of the Society who were not Members should be elected Honorary Members; the following were accordingly elected :—

Sir Arthur Smith Woodward, F.R.S., F.L.S., F.G.S.
The Rt. Hon. The Earl of Malmesbury, D.L., J.P.
Lt.-Col. Sir David Prain, C.M.G., C.I.E., F.R.S.
Sir F. W. Keeble, K.B.E., D.Sc., F.R.S.
Professor F. O. Bower, D.Sc., F.R.S.

Owing to the ill-health and increasing deafness of the Hon. Secretary, the Rev. A. G. Yates, Mr. Maurice Hellier, O.B.E., was in May appointed Joint Honorary Secretary with him.

In June a performance of Shakespeare's "Twelfth Night" was very kindly given by the Leamor Players in aid of the funds of the Society. The Play was given in the Society's gardens. Fine weather, ideal surroundings and excellent acting combined to make a delightful afternoon. The sum of £24 8s. was realised for the Society's Funds.

The Council regrets to record the loss from its number during the past year of Mr. F. B. Taylor, a valued Member of the Council, who was Hon. Editor from 1920 to 1925, and for 8 years Chairman of the Microscopical Section; Mr. R. Vowell Sherring, an original Member, and for 22 years a Member of the Council; Mr. J. A. Formoy, late Chairman of the Astronomical Section; and Mr. H. J. Waddington, an original Member, President of the Society in 1906-7, Vice-President from 1905 to 1914 and Chairman of Committee in 1906-7.

The following Members have also passed away during the year:—Mr. Stewart Burton, Miss L. Davison, Mr. E. F. Coddington, Miss George, Mr. Landseer Mackenzie, Mrs. Whitty Chandler, Dr. Nankivell, Mrs. Young.

In the monthly programme for May, 1929, the following Notice was inserted:—"The Council feels that it would be convenient if Members knew that, on visiting the Society's premises on certain days, they would find other Members there ready for a chat, whether Scientific or Social. In this way Members of different Sections would have a better opportunity of becoming acquainted, and assisting one another." The Council therefore, instituted "Club Day." It is gradually becoming more appreciated, and the Council, recognising its potential value, ventures to appeal for greater support from all Members of the Society.

At the request of the Mayor, the Council appointed a Committee, consisting of Rev. C. O. S. Hatton, Rev. F. R. C. Jourdain, Mr. L. Beeching Hall and Mr. G. Brumell, to discuss with the Municipal Finance Committee the question of a Museum. A joint Meeting on November 27th has led to no further action.

To meet the wishes of those Members who are unable to attend Lectures in the afternoon, a series of Evening Meetings have been held monthly during the year.

Through some misunderstanding the Exhibition of Wild Flowers did not begin at the usual time this year, but it has been taken in hand by Mr. H. J. Wadlow and other Members of the Botanical Section; it is apparently as popular as ever with the general public.

A Book has been provided in which all Members are requested to sign their names, as a permanent record. This book is always available on Club Days.

Gifts to the Society during the past year included folding chairs for the Lecture Room by Mrs. Claude Lyon, 2 Bookcases and a number of books by Dr. Crallan, and numerous gifts to the Museum and Library, reference to which will be found under those Sections.

The Society's Delegates this year were:—To the Meetings of the British Association, Mr. John Williams and Miss Marcia Penrose; to the Annual Congress of the South-Eastern Union of Scientific Societies, Col. E. B. Anderson; to the Spring Meeting at Salisbury and Stonehenge of the same Union, Miss Marcia Penrose; and to the Librarians' Conference which is to be held at Bournemouth during 1932, Mr. Claude Lyon has been appointed.

In conclusion the Council thanks sincerely all those who have given practical help to the working of the Society by giving Lectures, by organising Excursions, and in the arduous, but obscure and unconsidered work of distributing to the Members the copies of the Annual Volume of Proceedings. The Council also heartily thanks all other voluntary workers not on the Society's official list.

FORM OF LEGACY.

The following Form of Bequest is recommended for adoption by those who may be desirous of leaving by Will money for promoting the objects and work of the Society :—

I give absolutely to the Treasurer for the time being of the Bournemouth Natural Science Society of No. 39 *Christchurch Road, Bournemouth, for the general purposes of the Society the sum of £   s.   d. free of duty, and I declare that the receipt of the said Treasurer for the time being shall be sufficient discharge for the said legacy.*

Summary of Accounts for the Year ending 30th September, 1931.

RECEIPTS.	£	s.	d.
Current A/c.			
Members Subscriptions	490	10	0
Donations to General Fund	3	1	0
Sale of Proceedings of the Society	1	6	3
Rent from Tenants	135	0	0
Letting of Hall, etc.	4	7	6
Donations for Library	1	10	0
Refund from Bournemouth Education Committee of Cost of Wild Flower Exhibition 1930	1	2	0
Surplus from Excursions	20	12	9
Profit on Performance by the "Leamor Players"	4	8	0
Donation in connection with the above Performance	20	0	0
Sundry	4	6	6
	686	4	0
Balance from 1930	9	3	8
	695	7	8

PAYMENTS.	£	s.	d.	£	s.	d.
Interest on Debentures	201	5	10			
Less Tax	45	5	9			
				156	0	1
Interest on Loans	14	0	0			
Less Tax	3	3	0			
				10	17	0
Income Tax under Schedule D ...				11	10	4
Maintenance of the Society's House:—						
Rates and Property Tax ...	124	10	6			
Water, Light and Heat ...	64	14	1			
Wages	82	13	10			
Insurances	13	6	3			
Share of Telephone	3	3	0			
Furnishing and Upkeep ...	20	8	9			
				308	16	5
Secretarial Expenses:—						
Printing and Stationery ...	40	8	1			
Postage	34	0	9			
Other Expenses	15	0	0			
				89	8	10
Maintenance of Garden:—						
Wages	20	5	0			
Other Expenses	0	10	10			
				20	15	10
Special Expenses of Museum ...				0	10	4
Special Expenses of Library ...				11	19	8
Special Expenses of Lectures ...				1	11	6
Subscriptions to other Societies ...				2	8	6
Cost of Wild Flower Exhibition in 1930				1	2	0
Cost of Vol. XXII. of Proceedings of the Society				70	6	9
Part Cost of Vol. XXIII. of ditto				1	1	0
Sundries				0	12	0
				687	0	3
*Balance carried forward ...				8	7	5
				695	7	8

*Note.—There is a liability to pay £1 10s. 0d. (less tax 6s. 9d.) in respect of Debenture Interest which cannot be paid until Probate of

Deposit A/c. Debenture Fund.

	£	s.	d.		£	s.	d.
Balance brought forward	46	11	9	Paid for Chairs	2	10	3
Interest to Dec. 31st, 1930	1	3	6	Redemption of Debentures ...	30	0	0
					32	10	3
				Balance on deposit	15	5	0
	£47	15	3		£47	15	3

Building Fund.

	£	s.	d.		£	s.	d.
Balance brought forward	40	2	10	Balance on deposit	116	1	0
Donations	47	9	0				
Profit from Garden Fête	26	4	3				
Interest to Dec. 31st, 1930	2	4	11				
	£116	1	0		£116	1	0

Archæological Research Fund.

	£	s.	d.		£	s.	d.
Balance brought forward	15	18	4	Balance on Deposit	16	5	8
Interest to Dec. 31st, 1930	0	7	4				
	£16	5	8		£16	5	8

G. BRUMELL,
Hon. Treasurer,
1st October, 1931.

We have examined the above accounts with the books of the Society and vouchers for payment and certify the same to be correct.

(Signed) EDWD. BICKER & SON,
Incorporated Accountants.
(Signed) FREDERIC BROAD,
Hon. Auditor.

Bournemouth.
10th October, 1931.

NOTE.—The amount of Debentures and Loans outstanding is given in the Financial Note on the next page.

Financial Note.

It was stated in the Financial note on page 37a of the last volume of Proceedings that the full authorised amount of £3,400 of 6 per cent. Debentures was outstanding and that the sum of £305, secured on the personal guarantee of certain members, had been borrowed, of which £25 was free of interest and the remainder at 5 per cent.

During the past year, debentures amounting to £30, the holders of which had died, were redeemed, reducing the amount outstanding to £3,370. The amount borrowed on personal guarantee remains at £305.

The payment of interest on this large sum is a considerable strain on the Society's income and it is not possible at present to set aside any sum for a sinking fund. If, however, the capital debt could be substantially reduced the relief to income would allow of the formation of a sinking fund and the position would then rapidly improve.

The new Hall is acknowledged to be an immense improvement and one can scarcely think now how the Society could have put up for so long with the old cramped and inconvenient lecture hall; if there are some members who appreciate this but have not yet helped to make it a financial success, or others who feel they would like to do more in that direction, they are hereby assured that any donations they may make towards the reduction of the capital debt of £3,675 will be most gratefully received.

Report of Summer Excursions, 1931.

Wick. A conchological ramble on May 16th, led by Rev. C. O. S. Hatton and Mr. St. John Burton, was severely handicapped by inclement weather and partly also by the poor condition of the hedgerows, befouled by tarry waste from the roads. Still, the total " bag " justified the attempt, and should lead to a renewed effort next season.

Among terrestrial mollusca were found *Cepaea hortensis* (Müller), *Clausilia rugosa* Draparnaud, *Cochlicopa lubrica* Müller, *Ena obscura* (Müller), *Goniodiscus rotundatus* (Müller), *Helix aspersa* Müller, *Oxychilus cellarius* (Müller), *Retinella nitidula* (Draparnaud), *Trichia hispida* (Linné), *Vallonia pulchella* (Müller), *Vitrina pellucida* Müller and *Zonitoides nitidus* (Müller).

Near the river was found an interesting amphibious mollusc, *Succinea putris* Linné, a species now readapting itself to an aquatic existence after a long period spent on land, although originally fluviatile. *Succinea oblonga* Draparnaud, now rare in Britain, seems to be varying in the contrary direction.

Fresh-water species found near the river bank included *Limnaea peregra* Müller,—the ubiquitous marsh-shell—, a few *Planorbes, L. palustris* Müller, and the operculate *Bithynia tentaculata* (Linné).

Martin, S. Damerham and Rockburne Manor. On July 17th, after an interval of 20 years, acquaintance was renewed with the churches at Martin and South Damerham, both of Norman foundation and abounding in features of archæological interest, which were enlarged upon by Colonel Anderson and the respective Vicars.

The excursion was arranged to include a first visit to the Royal Manor of Rockburne, now held by the Earl of Shaftesbury, descendant of Sir John Cooper, who purchased the estate in 1608. The buildings consist of a 13th Century chapel, a 14th Century house, and a 15th Century barn. Interesting historical details of the Manor were given by Mr. Whitaker, and the party was conducted over the house by the owner, Mr. Wilson.

Sherborne St. John. This excursion, on July 29th, conducted by Mr. J. Hayes Barrett, broke fresh ground. Its interest centred round the church and the neighbouring mansion, the Vyne. In the former, attention was drawn by the Rector to the 13th century font, the Jacobean pulpit, the chained volumes of Fox's Book of Martyrs, the Brocas Chapel with its altar tomb and many brasses, and the South Porch with tablets commemorating the donors.

A short drive brought the party to the Vyne, the celebrated mansion built by Sir William Sandys, a prime favourite of King Henry VIII, who, on several occasions, was graciously pleased to accept its hospitality. A good century later the property was sold to the ancestor of the present owner, Chaloner Chute—Speaker of the House of Commons under the Commonwealth. The house is said to have been enlarged and altered by Inigo Jones, and the fine staircase was inserted by John Chute, the friend of Horace Walpole to whose exclusive use was devoted the " Strawberry Parlour " during his many visits to the Vyne.

Perhaps the most striking feature is the Chapel with its beautiful canopied stalls enriched with elaborate panelled tracery, its stained glass brought from Boulogne in 1544, and Italian tiles of an unique character.

In a prolonged tour of the house countless treasures and heirlooms were pointed out by Mr. Chute, to whom much of the interest and success of the excursion is due.

Rockbourne Down. The main object of this Excursion on September 3rd was the examination of the site of an extensive Roman farm settlement. The lay-out was described by Mr. Heywood Sumner in a lucid address, illustrated by his own drawings and embracing an interesting account of the social conditions of the period. The site has been thoroughly explored, and the fruits of excavation are stored in Salisbury Museum.

The adjacent Spring Pond, which presumably supplied the needs of the establishment, was also inspected before the party passed on to the Long Barrow, known as Duck's Nest, attributed to the Neolithic period.

Report of the Botanical Section.

The Botanical Section held 33 meetings, of which 7 were afternoon lectures and discussions, 25 excursions, and one "At Home."

Report of the Entomological Section.

The first meeting of the winter session was held on the 16th October, at which members exhibited specimens taken during the previous summer. Miss Chilver brought an interesting aberration of Epinephele hyperanthus, taken at Denny Bog in the New Forest on 15th July, having the usual 5 spots on the underside of the right underwing, but one spot only on the left underside. Such aberrations are of infrequent occurrence. Miss Chilver also exhibited cocoon clusters of Microgaster alvearius, a parasite of the currant moth Abraxas grossulariata. The Larvæ on leaving their host spin their cocoons in a regular cell-like formation attached to a twig. Mr. Webber exhibited a series of Smerinthus tiliæ, taken on lime trees in Bournemouth.

On the 20th November the Indian lepidoptera recently presented to the Society by Lieut. H. V. Ewbank were inspected. Mr. Webber exhibited specimens of Polygonia c-album, Epinephele hyperanthus var. arete, and a variety of Epinephele tithonus.

On the 6th January a paper was read by Dr. Crallan on the Liparidæ and Bombycidæ families of the order lepidoptera, which he illustrated with specimens in the collection presented by him to the Society. The stages in each species were described, and reference was made to the power of the freshly emerged female of some species of assembling to herself the males of her species. This power is probably derived through scent glands, the males being observed to fly up wind.

On the 17th February, Mr. Whitaker gave an epitome of a paper entitled "Yellow Freebooters" by Herbert Mace, F.E.S., which had appeared in a back number of "Science Progress." He described the methods adopted by wasps in the construction of their nests of using paper stripped from notice boards, which after mastication is converted into walls and roofs, as also the feeding of the larvæ on flies and caterpillars.

On the 17th March, Miss Chilver read a paper on the Indian lepidoptera presented by Lieut. Ewbank. The habits of the Danaidæ, Papilionidæ, Satyridæ and Nymphalidæ, were described, as also the migration of some species (Euplœa core), which takes place about three days before the breaking of the monsoon, thus giving due warning when that event will take place.

On the 13th June a meeting was held at Hengistbury Head. Owing to lack of sunshine insects were scarce and nothing of note was observed.

Report of the Zoological Section.

Summary of Observations on Birds, from October, 1930 to October, 1931.

1930.

Black Redstart (*Phoenicurus o. gibraltariensis*). Mr. B. H. G. Wormald states that a Black Redstart was seen several times subsequently to November 7th on the high ground north of Winchester (*Brit. Birds* XXIV. p. 191).

Little Bittern (*Ixobrychus m. minutus*). One shot in the Isle of Wight on October 3rd and set up by Jefferies the Newport taxidermist (F.B.H., *Field,* 30 Nov. p. 624).

Long-tailed Duck (*Clangula hyemalis*). One seen flying at the mouth of Poole Harbour in November (H. de C.L., *Field,* 20 Nov. p. 884).

Little Auk (*Alle a. alle*). [In the same note reference is made to two Little Auks picked up dead near Swanage in 1929, one on the shore and the other two miles inland.] Mr. C. F. G. Schwerdt also records one picked up alive at Alresford, Hants, on October 30, 1930 (*Field,* 6 Dec., 1930, p. 816).

1931.

Golden Oriole (*Oriolus o. oriolus*). In 1929 I received information as to the breeding of a pair of Golden Orioles in the New Forest. The birds were said to return regularly to the same locality. In 1931 confirmation of the report was received from a different source, which it is hoped to investigate later.

Crossbill (*Loxia c. curvirostra*). These birds have been present, though in variable numbers, during the whole of the time I have been resident in the district and probably for many years previously, and may certainly be classed as residents. With the exception of a few weeks in the height of summer, few days pass without hearing or seeing some of them. 1931 was a good breeding season for these birds. On February 16th a red cock was singing a sweet little song in a small pine in my garden : the hen meanwhile was on the nest in an adjoining tree. They were not disturbed and, I believe, hatched off successfully. On the heaths of East Dorset and West Hants they also bred freely. No fewer than seven nests were found, one with the unusual number of 5 eggs. Unfortunately, however, the newly hatched young suffered much from the depredations of marauding Jays. In the New Forest also several nests were found and the birds must have been breeding in fair numbers in one district.

Dartford Warbler (*Sylvia u. dartfordiensis*). The wet summer of 1931 operated in favour of this most interesting species, for there were no heath fires at the time when the birds were nesting.

Both in the New Forest and on the heaths of Dorset broods were to be met with in more than average numbers.

Wheatear (*Œnanthe œ. œnanthe*). Mr. C. E. Tucker reports three seen near Tuckton Bridge on March 20; Mr. A. Blinn also informs me that one was killed on Portland on March 15.

Cuckoo (*Cuculus c. canorus*). Among the rarer fosterers recorded in the district in 1931 two deserve special mention. A Cuckoo's egg was found in a Blackcap's nest with 4 eggs of the fosterer, and still more interesting was the discovery of one in a nest of Dartford Warbler with 2 eggs. The latter is one of the rarest fosterers of the Cuckoo in the British Isles.

Montagu's Harrier (*Circus pygargus*). Mr. B. J. Ringrose informs me a nest obviously belonging to this species (though described by the finder as that of a Buzzard !), was found in the New Forest this year. It contained two eggs when discovered.

Teal (*Anas crecca crecca*). Bred freely on the East Dorset heaths : three pairs found nesting in one locality near the border.

Garganey (*Anas querquedula*). This species has increased greatly in numbers during the past few years. Mr. A. Blinn reports a drake as already on its breeding grounds near Weymouth by March 20th.

Great Crested Grebe (*Podiceps c. cristatus*). In the "*Birds of Hants*" no record is given of the breeding of this species in South Hants; in Dorset also no nest has been recorded. As a census is being taken this year of the breeding pairs in Great Britain it seemed desirable to make enquiries with regard to Sowley Pond, the most probable breeding place. The result of these investigations was to prove that with the possible exception of 1923, when the birds were seen, but no evidence obtained of nesting, a pair has bred regularly since 1921, when they first appeared on the pond. For much information on these birds I am indebted to the Rev. R. Ll. Hodgson.

Ringed Plover (*Charadrius h. hiaticula*). On June 26th I noticed a Ringed Plover in a state of excitement, trying to drive off a pair of Partridges which had wandered close to its nest. This was not in the usual site among sand and shingle about high-water mark, but on arable ground some 50 or 60 feet above sea-level and half a mile or more inland from Christchurch Harbour. Probably the birds had been driven away from the shore by the numerous passers-by.

Curlew (*Numenius a. arquata*). Now breeds in fair numbers in the New Forest on the open heaths.

Snipe (*Capella g. gallinago*). Normally the Snipe in the meadows of the Avon Valley disappear as the marshes become dry, but in 1931 owing to the continuous rainfall they remained in great numbers until the opening days of the shooting season, and no fewer than 124 were shot on the first day near Harbridge.

Lesser Tern (*Sterna a. albifrons*). The little colony of about a dozen pairs on the Hampshire Coast is still flourishing, and at the beginning of June most of the nests contained eggs. Miss C. Popham noticed three birds over the crowded beach at Boscombe on October 9th, rather an unlikely spot to meet with this species.

Corncrake (*Crex crex*). These birds are not at all common in the district, but Mr. Ringrose noticed one in his grounds at Harbridge on September 20th, though none were heard in the spring.

Spotted Crake (*Porzana porzana*). The " clicking " note was again heard this spring in the same locality where it had previously been noted in East Dorset.

Mr. A. Ponchaud has kindly furnished me with the details of an immature male Sabine's Gull (*Xema sabina*), which was shot in Christchurch Harbour on August 31st, 1921. I have seen the bird, which is still in his possession. Only four previous records are given in Kelsall & Munn's *Birds of Hampshire.*

One or more Waxwings were also reported near Parkstone Golf Links in the early part of the year, and Mr. L. Beeching Hall states that Woodlarks bred in Parkstone this spring. No reports of Redpolls; but Crossbills bred in various parts of the district.

The following notes are supplied by Dr. Penrose :—

1930.

Oct. 9th.—A warm bright day with many swallows passing, also one or more Clouded Yellow butterflies in the garden.

Nov. 8th.—Last swallows seen.

Nov. 12th.—I watched 3 Red-throated Divers (*Colymbus stellatus*) fishing. They were being bullied by a Greater Black-backed gull, but I did not see it actually take a fish from any of them.

1931.

Jan. 14th.—Some 25 Gannets (*Sula bassana*) were observed fishing in the Bay.

Gannets were again seen several times up to February 16th.

Feb. 13th.—A Chiff-Chaff was seen in the garden about 1 p.m.

March 28th.—Two Sand-Martins were seen flying along the East Cliff at mid-day.

April 9th.—Some small Warblers, of which one was certainly a Willow-Warbler, were seen in the garden.

April 10th.—The first Swallow was seen.

April 11th.—A Black-cap (*Sylvia atricapilla*) was seen in the garden.

April 17th.—A Yellow Wagtail (*Motacilla f. rayi*) was seen by the Avon at Hurn.

May 1st.—The first Swifts were observed, also a Whimbrel (*Numenius phæopus*) in Poole Harbour.

F.C.R.J.

Report of the Geological Section

Animal remains are so scarce in our gravels that the discovery of part of a mammoth tusk near Ibsley in 1930 is worth recording. A full account of it will be found in Mr. Heywood Sumner's "Local Papers" (1931. p. 135).

During the excursion to Swanage (June 2nd) it was found that the Gault was once more exposed in Punfield Bay, where it had been for many years concealed by a land slide.

The excavations for a new esplanade at Branksome Chine were carefully watched, in the hope of finding a bed of peat with tree stumps, similar to that found a few years ago, below sea level, at the mouth of the Bourne; but nothing of the kind was seen.

Library Report.

The Hon. Librarian is pleased to record the gift of an unusual number of valuable books and other publications, during the past twelve months; and he takes this opportunity of thanking the donors. Owing to the limitation of space it is not possible to enumerate in this Report the titles of the books or the names of the donors. But a list has been prepared and may be seen on the Notice Board in the Entrance Hall. A few books and other publications have been added to the Library by purchase.

The exchange of the Society's Proceedings for the Proceedings or Reports of other Societies both at home and abroad has been continued, and many interesting publications have been received in this way.

Museum Report.

Donations have been received as follows:—

- Dr. Crallan, a Cabinet of Minerals, emu's eggs, and various fossils.
- Rev. W. H. Webster, a Cabinet of Eocene fossils.
- Henry Bury, Fossil Coral.
- H. F. D. Bartlett, a Cabinet of Beetles.
- H. H. Haines, Shells and Bones.
- Miss E. M. Turner, Emu's eggs.
- The Blackmore Museum, Egyptian Archæological Specimens.

Presidential Address.

Fossil Plants and Evolution

By D. H. Scott, F.R.S.

First of all let me thank the Society for again electing me as President, after twenty years. It is an honour which I warmly appreciate, for I have long known this Society and have always been impressed by its vigour and many-sided activities.

The question which I propose to consider to-day is this: how far does the geological history of plants throw light on Evolution? Does it afford satisfactory evidence for the Theory of Descent, and does it tell us anything of the origin of the groups of plants now living? The striking evidence drawn from the Palaeontology of the Animal World is more or less familiar; all have heard something of the evolutionary history of the horse, the elephant and the camel, and even of man himself. How does it stand with the Plant Kingdom? Let us take the chief classes of the higher plants in the living Flora.

I. *The Angiosperms, or true Flowering Plants.*

These, as we all know, produce their seeds in a closed ovary or seed-vessel. Fertilization takes place through the stigma and style.

Their sudden appearance during Cretaceous times, which so troubled Darwin, remains a mystery, for the earliest undoubted Angiosperms, if rightly determined, belonged to families still flourishing in our own day. They were as highly organised, and apparently as varied, as their living representatives. Neither does the fossil record throw any light on the relation between the two classes, Monocotyledons and Dicotyledons. It is now customary to regard the former as derived from the latter. This may be so; but a number of Monocotyledons, including the great family of the Palms, were flourishing in the Cretaceous period much as they are now.

It is quite clear that Flowering Plants must have existed long before their remains begin to be obvious. Some direct evidence of their antiquity has already been obtained; I may instance Mr. Harris's discovery of leaves, in all respects Dicotyledon-like, in rocks of Rhaetic age in East Greenland. But have we any light on the *origin* of the Angiosperms? It is dim enough, but there is some evidence which may bear on the question.

1. There is the fact that in the earlier Mesozoic, long before the influx of Angiosperms, there were plants with *flowers*, compar-

able in the arrangement of their organs, though not in the details of structure, with the familiar flowers of our own day. I refer to the so-called Fossil Cycads, a great Mesozoic group totally unlike the much simpler surviving Cycadaceæ, as regards their reproductive organs. The flowers of *Cycadeoidea,* 4 inches or more in length in the bud, had an envelope or perianth of bracts, then a whorl of extremely complex stamens, and in the middle the female receptacle bearing the ovules—just the same arrangement as in any "hermaphrodite" flower. The details of course were quite different. When the fruit was ripe the seeds show a Dicotyledonous embryo, filling the cavity—practically exalbuminous seeds, unknown among Gymnosperms.

In habit *Cycadeoidea* was like a Cycad, and unlike any typical Angiosperm, but the older Mesozoic plants of the group were less Cycad-like and more comparable in habit to such Angiosperms as a *Magnolia.* It is quite probable that the Mesozoic Cycads (so-called) may have had some affinity to the early Angiosperms, though no direct filiation is possible.

2. In quite another direction there is Dr. Hamshaw Thomas' discovery that in the Middle Jurassic, *de facto* Angiosperms, i.e., plants with closed fruits containing seeds, were already present. He names the group Caytoniales. He finds that a number of these fruits were borne in two rows on a stalk which he interprets as a female sporophyll. A stigma is present on each fruit, and several seeds are contained in the closed cavity. Possible male organs, with four-lobed sporangia, compared to the anthers of an Angiosperm, are attributed to the same plant, and also vegetative foliage in the form of palmate leaves.

Dr. Thomas's observations appear to accord ill with the Cycad theory already considered. In his plants there is no suggestion of a flower. It is difficult to trace a relation between the fruit-bearing organs and the carpels of a true Angiosperm. We may, however, admit, with Professor Seward, the possibility that the Caytoniales may have belonged to a branch of the line of descent which ultimately led to the modern Flowering Plants.

II. *The Gymnosperms.*

The naked-seeded plants, though classed as Phanerogams, are on a totally different footing from the Angiosperms. While the latter, on present evidence, are the youngest of the great groups, the Gymnosperms are among the oldest of terrestrial plants.

There are four living families: the Conifers, the Maidenhair Trees, the Cycads, and the Gnetaceae. We will leave out the last, as there is no fossil evidence concerning them. The Conifers certainly go back to the later Palaeozoic, the Upper or Middle Coal-measures, possibly further. In wood-structure some of them, namely the Puzzle-Monkeys (Araucarians) resemble the great Palaeozoic family of the Cordaiteae, which preceded them, but there are important differences in the fructification. Recent evidence goes to show that the Fir-trees (Abietineae) are an ancient race, at least as old as the Permian, as shown by the double cone-scales of *Voltzia*. There is nothing, however, as yet, to connect the Conifers directly with any earlier group of plants.

The Maidenhair Trees, now represented by a single species, *Ginkgo biloba*, were an important race in Mesozoic times. Their fertilization by spermatozoids and the character of their fructification tend to connect them with the Cordaiteae.

The "flowering" Cycads of the Mesozoic have already been referred to. It seems impossible that they can have any direct relation to the far simpler Cycadaceae of our own times. A few Mesozoic fossils, however, are known, which resemble the fructifications of recent Cycads, and suggest that the latter were themselves of great antiquity. It is possible that the whole class may owe its origin to the Seed-Ferns of the Palæozoic, but as yet the evidence is scanty.

The Seed-Ferns were a highly characteristic Palæozoic group, perhaps extending also into the Mesozoic Era. The plants, in habit, are so like ferns, as to have deceived almost all botanists, even Sir Joseph Hooker. But we now know that some of these Fern-like plants bore true seeds, of complex structure, of the same type as the seeds of recent Cycads. The oldest known plant to which seeds are attributed (the Upper Devonian *Eospermatopteris*) appears to have been of this affinity, for its habit was that of a tree-fern. It is thus probable that the Seed-Fern line goes as far back in time as that of the true Ferns.

But there were other Gymnosperms at least as old. The Cordaiteæ, essentially an Upper Carboniferous family, were great trees with long simple leaves, wood like that of Araucarian Conifers, and seeds of the same type as the Seed-ferns, Cycads and Maidenhair Trees. The male organs may perhaps be compared likewise to those of *Gingko*.

The *Pitys* family was older, of Lower Carboniferous and Devonian age; these again were great trees, in some cases with needle-like leaves. Nothing, however, is known of their reproduction. If we may judge by the wood-structure, trees of this type were as old as any known land-plants. If they were really Gymnosperms, then the origin of the class is lost in unknown antiquity. But we have no actual seeds older than the Upper Devonian. We know nothing of the origin of the seed; all is speculation. All we can say is that the Seed-Ferns, in so far as they bore their seeds on the ordinary leaves, may be called the most primitive Seed-plants known. But we cannot construct any genealogical tree for the Gymnosperms.

III. *The Ferns.*

True Cryptogamic Ferns undoubtedly go back to the Devonian. In the Tertiary they were much as they are at present. In the Mesozoic they mostly belonged to existing families, but chiefly to such as are now somewhat in the background (Gleicheniaceae, Osmundaceae, etc.). In the Palaeozoic the Osmundaceae (the Royal Ferns) can still be traced, and in all probability there was an important group allied to the Marattiaceae, though some have been inclined to interpret the group as Pteridosperms. There is still in fact great difficulty in distinguishing true Ferns from Seed-Ferns among Palaeozoic fossils.

Many of the older undoubted Ferns belonged to peculiar, now wholly extinct, families, very different from any now living.

A plant (*Aneurophyton*) has been discovered in the Middle Devonian of Germany, which had the habit of a Tree-fern, with large, compound fronds; but the leaves had the same anatomical structure as the stem. This curious fact supports the theory that all Fern-fronds (and perhaps all large leaves) started as modified branches of a thallus, which thus gradually got differentiated into stem and leaf. Some of the oldest Devonian plants (*Psilophytales*) though with no distinct leaves, had crozier-like (circinate) vernation of the thallus-branches, thus foreshadowing the fronds of a Fern. On similar thallus-branches the sporangia were borne terminally, just as they were on the fertile fronds of some of the earliest Ferns. Thus it appears that we can trace back the Fern line to its origin among plants which were still at the Thallophyte stage.

IV. *The Horsetails.*

Our modern Horsetails, in the form of the genus *Equisetites,* go back to the early Mesozoic, without any great difference from the living plants, except that the earlier representatives were considerably bigger.

The Calamites of the Carboniferous were, as we all know, trees. They were undoubtedly related to the Horsetails of later times, but probably were not their ancestors. Most likely the comparatively small *Equisetites* type existed all through and has left its little-altered descendants. But this is still doubtful.

When we get back beyond the Carboniferous, plants of the Horsetail class are rare. The oldest known are from the Middle Devonian. The plants were of no great size. In the generally whorled leaves and the structure of the cones they show clear affinity with the Articulatae (to which the Horsetails belong), but their stems were forked, a character unknown among the later representatives. Like some of the earlier *Calamites* these Devonian plants had well-developed leaves, possibly suggesting some relation to the Fern line. It is not impossible that, like the latter, they may have sprung from the early group which we call *Psilophytales*, already mentioned.

V. *The Club Mosses.*

The vast importance of the Palæozoic Lycopods, probably the dominant trees of the swampy Coal-Forests, is well known. Here again it is not likely that our living Club Mosses (*Lycopodium* and *Selaginella*) are the degenerate descendants of the Palæozoic giants. We know that, contemporary with these, there existed small Lycopods, some of them almost identical with members of the living genus *Selaginella*. The herbaceous Club Mosses, for all we know, may always have been herbaceous, and have come down with little change, to our own day. On this view the related trees of the Carboniferous forests would have been a dominant, but blind-ending branch of the main Lycopod phylum.

There is, however, a possibility that our Quillworts (*Isoëtes*), so different from their living relations, may be extremely reduced descendants of the old trees. A somewhat intermediate form (*Pleuromeia*), imperfectly known, is found in Triassic rocks.

Tracing back the Lycopods beyond the Carboniferous, we find that they were already flourishing in full strength in the Upper Devonian. Still further back, in Middle and Lower Devonian beds, we meet with plants of like habit, but combined with strange characters. The Middle Devonian *Asteroxylon* had a leafy stem like a Club Moss, but the leaves had no complete vascular supply and the sporangia were borne on naked branches —quite unlike any Lycopod arrangement, but rather suggesting the fertile fronds of some Palæozoic Fern. It is thus possible that in the oldest known land flora we may have a synthesis of microphyllous and megaphyllous races. But we must remember that our knowledge of these very old plants is still too limited to allow of any positive statement.

CONCLUSION.

Surveying the whole record, incomplete as it is, we see that in a general way, and in spite of many difficulties, it supports Evolution. The class which we recognise as the highest, the Angiosperms, was the latest to appear. At the other end of the scale the earliest known plants of the land include forms far simpler than any of their successors. The Seed-ferns of the Palæozoic—" Phanerogams without flowers "—are, in the absence of any special reproductive shoots or sporophylls, simpler than any of the later seed-bearing plants.

,On the other hand, the great antiquity of wood, which to all appearance is that of Gymnosperms, is an old difficulty. The fact was well known to Hugh Miller long ago, and he used it with much vigour as an argument against the " Development " theories of his day. What it really shows is that the evolution of land plants must have started much further back than our present records show. There must surely have been *repeated* invasions from the sea.

The Early Devonian Psilophytales are not only simple—they are vascular plants with the habit of Thallophytes and some of them actually seem to bridge the gulf between the Algæ and the land-plants; they still show transmigrant characters.

The unravelling of the course of evolution is a difficult and perhaps an impossible task. We may ask if the scheme of descent as a richly branching genealogical tree still holds good, or must we rather picture a number of parallel lines of evolution? A high authority on fossil botany has said that the history of plants suggests to him a bundle of sticks rather than a tree. Another authority has a great deal to say about parallel development, but little or nothing about the synthetic groups in which we used to believe. A zoologist, Dr. Pzribram, has gone much further and is reported to maintain that every species now living has its own separate line of descent back to the primeval protoplasm!

On such a view, affinity, as understood by systematists, would be no evidence of blood relationship, or rather there would be no such thing as affinity, but only unexplained resemblances. Affinity, however, is the basis of Evolution. Systematists have long been convinced that their " natural affinity " is the expression of relationship by descent. On the extreme parallel-line theory we should have Evolution without affinity—" Hamlet without the Prince of Denmark." We need not consider the theory in this exaggerated form, but may look at the question in a broader way. Is there any palæobotanical evidence for the existence in the past of synthetic groups, combining the characters of two or more later lines? Such groups ought to be found, if the old conception of descent as a branching tree is correct.

We certainly have to go back a long way to find anything of the kind. Appearances may be delusive. At one time it might have been supposed that the *Cordaiteæ* of the Carboniferous were a synthetic group, for they combine certain characters of the Conifers, Maidenhair-Trees and Cycads. But the discovery of the Seed-Ferns overturned any such theory. They are much older than the Cordaiteæ, and much more like Cycads. I think it quite likely that all the Gymnosperms may have had a common source, but if so we know nothing about it—the source lay too far back.

It is, however, quite a tenable view that in the Early Devonian we have a real synthetic group in the *Psilophytales*. They are the simplest land-plants known, and appear to combine some of the characters of Ferns and Club Mosses, in a primitive form. The earliest Articulatæ, too, are not so very remote. Further, some of the Psilophytales show features suggestive of the Moss line, while several of them approach very near to the Algæ from which they may have been derived. It is not at all improbable that several of the higher groups of plants owe their origin, if not to the Psilophytales at least to early land-dwellers or transmigrant Algæ of that affinity. This view has, I believe, the support of Professor Halle's high authority.

The parallel-line theory is true up to a certain point; the several lines of descent go very far back. But we need not exaggerate it. It is impossible to construct a genealogical tree of the Vegetable Kingdom, but the tree-symbol is probably still the best scheme for picturing the course of evolution to our imagination. The symbolic tree must have had very long parallel branches—perhaps something like a Lombardy Poplar!

Selected Papers.

' Fossils and Evolution."

By Henry Bury, F.L.S., F.G.S.

(From a Lecture given December 4th, 1930.)

In the half century which elapsed between the publication of Lamarck's " Philosophie Zoologique " and of Darwin's " Origin of Species," the idea of evolution, or the " Transmutation of Species " as it was then called, was carefully considered by every biologist of repute, though nearly all of them rejected it; and one of the commonest grounds for its rejection was the belief, which was supported by the high authority of Cuvier, that it did not accord with the facts of geology. Darwin, however, had no difficulty in showing that Cuvier and his colleagues had fallen into two errors; in the first place, most of them were looking for direct connecting links between existing animals, instead of searching for more generalised forms which might be regarded as ancestors. To take an extreme case as an illustration, it would be useless to search the geological strata for an animal intermediate between a horse and a cow; but if we can trace them both back to four-toed or five-toed ancestors, we may obtain an insight into the history of the whole class of Hoofed Animals or Ungulata. The second error, which is very conspicuous in Cuvier's writings, is that he did not make nearly enough allowance for the imperfection of the geological record—for the fact that the conditions under which it is possible for animal remains to be preserved are so rarely fulfilled that only an infinitesimal number of the species that have existed in the past have ever been preserved at all. Two of the most powerful chapters in the " Origin of Species " are devoted to this subject, and there is no need to repeat the arguments here, but one or two points may be insisted upon; first that the record becomes progressively more imperfect as we go back in time; and secondly that the series of Pre-Cambrian (Archæan and Algonkian) rocks, in which practically no fossils are found, probably represent a period of evolution even longer than that of all the geological epochs which have succeeded them. Why they are so deficient in fossils is a difficult question to answer; but there seems no reason to doubt that life existed as far back as the earliest sedimentary rocks known. As Darwin himself insists, " positive palæontological evidence may be implicitly trusted; negative evidence is worthless."

If evolution has really occurred, we might expect geology not only to support the other lines of evidence in its favour, but also to supply, as its special contribution to the subject, evidence as to the succession in time; for it is clear, on this hypothesis, that what we class as the lower animals ought, on the whole, to appear before the higher forms. Unfortunately, owing to the extreme imperfection of the record, especially in the older rocks, no clear sequence can be distinguished in the main sub-divisions of the Invertebrata; and although we fare better with the Vertebrates, yet even there the classificatory and geological successions do not in all respects correspond. The most primitive class is that of the Fishes, which first appear in the Upper Silurian. The Amphibia come next in the Carboniferous, and are followed by the Reptiles in the Permian. So far then the order of succession in time agrees exactly with that of classification; but now we come to an anomaly, for whereas we regard Birds as more primitive than Mammals, the latter are present in the Trias, while the former have not yet been found earlier than the Jurassic. This, however, need not be taken as contradicting the evolutionary doctrine, since the two classes undoubtedly sprang from different orders of Reptiles, and although the Birds separated off at a later period, yet we can hardly say that the earliest Mammals were more highly organised than the earliest Birds. While therefore the evidence as to succession in time is unsatisfactory, it is not definitely hostile; and if we now direct our attention to the general effect of palæontology on the evolutionary problem, we shall find, amid many deplorable gaps in our knowledge, a number of striking and valuable facts.

We will begin with the Vertebrata. Leaving out of account the anomalous Amphioxus, which is unlikely to be found in a fossil condition, the most primitive living fishes are the Cyclostomi (Hags and Lampreys), but as they have only cartilaginous skeletons their chances of preservation in the rocks are small, and it caused no great surprise that for a long time the earliest fossil fishes were attributed to the Ganoids—by no means a primitive order. But gradually a suspicion arose that some of them (called Ostracodermi by Cope), in which no jaws could be found, might be allied to the Cyclostomi, and this was further suggested by two extremely primitive fishes found by Dr. Traquair, early in this century, in the Upper Silurian of Scotland. They were very imperfect, and he had some difficulty in determining which was the dorsal and which the ventral surface. But the tail in each case is of the "heterocercal" type, that is to say, it has two unequal lobes, into one of which the vertebral column extends; and since in all living fishes with tails of this type, it is the dorsal lobe into which the vertebræ run, Dr. Traquair assumed that this must be the case in his fossils. Recently however some much more perfect specimens have been found in Scandinavia, which, while leaving no doubt that these and the other Ostracoderms are closely akin to the Cyclostomi, show that it is the ventral lobe which is occupied by the vertebræ, and that Dr. Traquair had drawn his fishes upside down! We are reminded of a similar difficulty, which occurred during a famous trial, in dealing with some of Whistler's pictures. The interesting point, however, is that the modern lamprey passes through a larval stage in which the tail is similarly "hypocercal," that is to say, it has the vertebral column extending into the ventral lobe. In this case therefore geology supports anatomy not only in showing that the first fishes to appear are closely allied to the Cyclostomi, but also in giving us in an adult fossil a structure only seen in the larval stage of the lamprey.

Although it is from the living species of Dipnoi that we learn the origin of the lungs of the higher Vertebrates, yet it seems from the structure of the skull that it is not to these fishes, but to the Crossopterygii, which flourished in the Devonian, that we must look for the immediate ancestors of the Amphibia; and this is further suggested by the fact that from the Crossopterygian fins we get a dim idea of the evolution of the jointed limbs; but we still find reason to wonder that the fore and hind limbs should correspond so exactly, bone for bone, and joint for joint, seeing that they can never have been used in exactly the same way; while the persistence of five digits as the typical number from the lowest Amphibia up to man himself is even more extraordinary. Cases of reduction in number are common enough, and indeed one of the earliest Amphibia known had the toes reduced to four on the fore limbs; but no species living or fossil (with one or two very doubtful exceptions) has ever had six toes as a normal condition, in spite of the fact that abnormal variations in this direction are of frequent occurrence. From the early date at which reduction occurs it is evident that this number five was not impressed upon the organism over a long period of time during which it was essential to existence, and it is at least open to doubt whether this feature is due to Natural Selection (in the ordinary sense) at all, and is not rather an expression of some obscure laws of growth of which we know nothing. At any rate nothing in geology throws any light on the problem.

The structural differences between Amphibia and Reptiles are not very great, and a fairly complete series of intermediate forms is now known; while an equally clear transition from Reptiles to Mammals is also found—so complete that it is impossible to say where the line should be drawn. The principal differences between these two classes at the present day (we are here concerned only with the hard parts) lie in the teeth and the position of the limbs. The teeth of mammals are firmly rooted in their sockets, and are usually differentiated into incisors, canines, premolars, and molars; but it seems that both these features were already developed in some of the fossil Reptiles. The limbs of living Reptiles are set at a considerable angle to the body, which sags down between them almost to the ground; whereas in mammals the feet of opposite sides are brought near together, and the body is well raised off the ground. This is effected by the rotation of the humerus backwards, and the femur forwards till these bones lie almost parallel with the vertebral column. In the case of the hind limb this automatically causes the toes to be directed forwards, in a position convenient for walking; but in the case of the fore limb a further change is necessary to prevent the toes from being directed backwards; and this is brought about by the rotation of the radius on its axis, so that it crosses the ulna, and brings the fore foot into the position of " pronation " in which it is maintained throughout life in the majority of Mammals. It is singular to observe that Man, so highly organised in some respects, is primitive in the retention not only of five digits, but also of the power of placing the hand and forearm in the original position of " supination." These changes, like those of the teeth, took place in the higher Reptiles (Theromorpha) before true Mammals appeared.

The history of Birds is not so well known. The earliest fossil (Archæopteryx) is reptilian in the possession of teeth (which it shares with other fossil Birds), in its jointed tail, and in having three distinct digits on the fore limb; but in most respects it is very definitely a bird. On the other hand some fossil reptiles (Dinosaurs) have a very bird-like skull; their pelvic girdle was in many respects similar to that of birds; they had air cavities in their bones; and many of them walked on their hind legs, and had the toes reduced to three, so that the impressions of their feet in Triassic sandstones were at one time attributed to birds. We can safely say therefore that there is a close alliance between Dinosaurs and Birds, but so far direct ancestral forms are wanting. It would be of great interest, especially in tracing the geographical distribution of fossil reptiles, if we could ascertain at what stage warm blood was acquired, and whether it was independently developed in the ancestors of Birds and Mammals. Unfortunately we can hardly hope for such information about soft parts, but there are differences of structure of the heart and blood vessels in the two classes which make it not at all improbable that the same result was obtained along different lines; and it is perhaps significant that the Dinosaurs are never found much beyond latitude 50°, although there is reason to believe that the climate at that zone was warmer than now; while on the other hand warm-blooded animals at the present day approach much nearer to the poles.

We should much like also to know something of the origin of feathers. Sir Ray Lankester thought that they originated in connection with swimming, but it is at least equally probable that they first appeared as a protection against cold, and that the fore limbs, provided with stiffer quills, were used to accelerate speed on land (as in ostriches, and in half-fledged chicks running for their food) before they definitely became wings. In open country longer and longer hops might thus become possible, until at last true flight was achieved.

It is evident then that geology does give us a good deal of information about the origin of the chief classes of Vertebrates, and when we descend from classes to orders, families, etc., we obtain many more facts of interest, and in a few instances fairly complete genealogies. Thus the Horse can be traced back to very generalised four-toed ancestors in the Eocene, while several early fore-runners of the Elephant have been found in the Egyptian Fayoum. But these are too well known to need further comment here.

When we turn our attention to the Invertebrates, we find a much less satisfactory state of affairs, for all the main groups must have arisen very early, and in no single case are the connecting links preserved in a fossil form. Sponges (Porifera) are found as early as the Cambrian, Cœlenterates in the Ordovician (Graptolites) and Silurian (Corals) ; but we have no clues as to their evolution. Among Echinoderms, Crinoids and Asterids appear in the Cambrian, Echinids in the Ordovician, and Ophiuroids in the Lower Silurian. The early Crinoids were attached to a stalk throughout life, but in other respects were just as fully developed as the modern forms, which are (in most cases) only stalked when young. Embryology suggests that Starfish and Sea-Urchins were also fixed at one period, but we find no confirmation of this in the rocks.

The Vermes, owing to their softness, are seldom preserved, but what appear to be worm-casts occur in the Cambrian, and perhaps the Pre-Cambrian. Many of the Crustacea pass through a larval stage, known as Nauplius, with six legs; and as that number is characteristic of all true Insects (Hexapoda), of the larval stages of many Arachnida, and of the Cirripedes (Barnacles), it seems possible that all the Arthropods are descended from a six-legged ancestor; but if so that ancestor dates back to Pre-Cambrian times, for in the Cambrian rocks we find Hymenocaris, which seems to be a Phyllopod, and many Trilobites, which are variously classed with the Crustacea and with the Arachnida. Insects of rather doubtful affinities appear in the Silurian, but it is not until the Carboniferous that they become common, and even there only a few of our modern orders are represented. The enormous size of some of the early Dragon-flies, which measured over two feet across the wings, is perhaps connected with the fact that in those early days they were the sole denizens of the air. But none of the fossils give us any clue to the origin of the wings. Of the two classes of Molluscoidea, the Bryozoa were already fully developed in the Ordovician, while the Brachiopoda are among the oldest fossils known, Lingulella from the Cambrian rocks being almost identical with the living Lingula. All four classes of the Mollusca (Lamellibranchs, Gastropods, Pteropods, and Cephalopods) go back to the Cambrian, so that here, too, the origin of the phylum must be Pre-Cambrian.

As a general rule the production of new species involves divergence from a common stock, but cases also occur of " convergent " and of " parallel " evolution—the former term being applied to the production of similar structures from dissimilar ancestors, and the latter to the production of a *series* of closely similar structures from allied ancestors : but it is doubtful whether a clear distinction can always be drawn between them. Examples of convergence can be seen among living animals, e.g., in the independent development of wings by birds and bats, and also in many cases of mimicry ; but parallel evolution can only be proved when palæontology provides several members of the series.

The belief, held by more than one writer, that the Horse arose independently in Europe and in North America, the series being at first parallel and finally convergent, is probably fallacious; but a genuine case of parallelism is afforded by the Horse on the one hand and the extinct Litopterna on the other. Both belong to the Ungulata, but to distinct sub-orders ; yet in both we find a closely similar series of reductions from a three-toed to a one-toed form. Another clear case is seen in the marked enlargement of the brain which took place among Reptiles and in different orders of Mammals during the Tertiary period. This would perhaps be easier to understand if it had only set in after man appeared; for the advent of such an animal, depending for his very existence on his intelligence, may well have had an influence upon the animals he hunted; but the change began long before his evolution, and the great size of his brain seems to be itself a consequence, and not a cause, of a general movement, the nature of which is obscure.

Other examples of parallel evolution, in some ways even more striking, are found among the Invertebrate Nautiloidea and Ammonoidea. Both possess a shell divided by cross partitions (septa) into numerous chambers, through which runs a tube or " siphuncle "; but while this tube is central in the Nautiloidea, it lies at the edge of the septa in the Ammonoidea. The former appear some time before the latter, but in both the earliest shells are straight; these are followed by curved, or coiled forms with the coils quite separate : then come others with the coils resting lightly on one another, and finally the outer coils overlap the inner, as in the modern Nautilus. But while the latter remains tightly coiled, in several fossil families we find a retrograde process in which the coils of the shell become loose again; and a precisely parallel series of changes, ending up in a straight shell, occurs among Ammonites, especially in the Cretaceous period, a little before they die out altogether. Not only are these remarkable changes displayed by Nautili and Ammonites as a whole, but they are independently developed in several distinct lineages within those orders. But this is not all. In the earliest Ammonites the sutures (edges of the septa) are only slightly curved, but soon they begin to get more and more complicated, until they reach a foliated condition which defies description, and can only be understood with the help of specimens or figures. And then, complication having reached its zenith, we get, as in the form of the shell, a gradual reversion to primitive simplicity; but the two changes are independent, and we may find a highly complicated suture in a shell already uncoiled. A further point of importance is that we are able to recognise, by the general pattern of the suture, several lineages of Ammonites, and each lineage independently develops, as time goes on, greater complications, to be followed, in many cases, by reversion. Yet a third series of changes occurs in the ornamentation of the shell, which gradually increases up to a point, and then declines again. But these changes in sutures and ornament are best seen in Ammonites, and are only feebly developed in the Nautiloidea. What may be the causes of these parallel developments it is difficult to say. Mere adaptation to changing conditions seems an insufficient explanation, especially as the three lines of parallelism—in form of shell, in sutures, and in ornamentation—are not correlated with one another, but vary independently; and several writers have postulated the existence of some " evolutionary trend " which, when once started, takes control and continues its development more or less independently of the environment. As an explanation this does not carry us far, and it reminds us too much of the case quoted by Carlyle, where the action of the meat-jack was attributed to its "inherent meat-roasting tendency." Yet there is a good deal of evidence that such trends or tendencies do exist, and by studying them we may perhaps learn something of the machinery of evolution, about which, it must be confessed, we at present know little.

Another feature of the Ammonites which has given rise to much speculation is the fact that the degenerative changes of which we have spoken are especially noticeable towards the close of the secondary era, just before the whole race died out; and some writers have compared the sequence from simple to complex, and back again to simplicity with the passage of an individual from childhood to manhood, and then to old age; in other words they suggest that the extinction of the Ammonites was due to a form of senile decay; though how it is possible for a whole group of animals to suffer from old age has not been explained. Others again are disposed to see in the increase of ornament and of complications in the sutures methods of strengthening a thin shell; but while one writer regards the septal complexity as a means of getting rid of superfluous lime, another declares that the thinness of the shell, and consequent need of strengthening structures, is due to deficiency of lime. Neither explanation is quite satisfactory, for superfluous calcareous deposit could be cured much more effectively by thickening the whole shell than by complicating the sutures; while even if it is possible for a deficiency of lime to occur in the sea, which is in constant movement, and is always receiving fresh supplies, the fact that other fossils in the same beds as the Ammonites have shells of ample thickness is opposed to the second proposition. Perhaps a more plausible solution of the problem is that the Ammonites became too highly specialised, and so were unable to adapt themselves to changes in the environment, which in more primitive forms either served as a stimulus to further evolution, or could be met by greater plasticity in the existing organism. In the opinion of many biologists this has been a potent cause of extinction in several groups of animals.

From the brief survey given above of the light thrown by fossils on evolution it is evident that our chief difficulty lies in the imperfection of the geological record; and it is safe to say that, but for that obstacle, the doctrine of evolution would have been accepted long before Darwin's day. It is not merely the absence of soft parts which troubles us, but also the fact that even the hard parts are very unevenly distributed, and that the record is far more complete in the newer than in the older fossiliferous rocks (Palæozoic) ; while the Pre-Cambrian period, which represents more than half the sum-total of geological history, contains practically no fossils at all. And yet it was in the Pre-Cambrian era that all the main groups of Invertebrates arose.

But in spite of all these difficulties, palæontology does afford a great deal of assistance; and, if it gives little information as to the succession in time (but at least nothing of a hostile character), it supports each of the other lines of argument on which Darwin relied. It is of immense service in solving the problems of geographical distribution; it supports embryology by giving us adult structures in the past which are only found in embryos and larvae to-day; and, above all, it supports the argument from comparative anatomy by providing us with a number of "generalised" types from which our more specialised modern forms have descended, and in some cases (e.g., the Horse) showing us the very steps by which the changes were effected.

On the subject of Natural Selection little help can be expected from this source; but there is a good deal to suggest that evolution is not always free to move in every direction, but is often guided and directed along certain definite lines by unknown forces or "tendencies" within the organism itself. It is frequently stated that these series of modifications are irreversible; but while that appears to be true of the changes in the teeth and limbs of Vertebrates, it does not altogether accord with the so-called "senile decay" of the Ammonites.

No attempt has been made in the foregoing pages to deal with anything but animals; but the history of fossil plants has already been admirably described by Dr. D. H. Scott in last year's volume of our Proceedings.

"The Discovery of Mercury Helide."

Abstract of a Lecture by the discoverer, J. J. Manley, D.Sc., M.A.

The most convenient way of describing the discovery is to describe the experiments and researches which led up to it.

Some twenty years ago a re-determination of the variations in the specific heat of water by the method of cooling was planned. The requirements of this investigation included standardised weights, platinum thermometers, and an inert gas, and from the beginning great and quite unexpected difficulties were encountered. It was found impossible to get suitable platinum thermometers, and when standardising the weights no two balances were found to give quite the same values. These difficulties alone gave rise to researches lasting some years. A third unforeseen difficulty, that of obtaining a high and quite constant vacuum, resulted in the discovery to be described.

For the investigation of the specific heat of water, the liquid in a cylindrical vessel was to be enveloped by a high vacuum (higher than that required for the generation of X-rays), and it was of prime importance that this vacuum be kept constant, since within even the highest vacua attainable myriads of molecules still remain and, during the cooling, pass from the hot to the cold surface, carrying and depositing on each journey a minute packet of heat, thus causing, if their numbers vary, errors of unknown magnitude in the rate of cooling.

It was found that the small residual pressure in a highly evacuated and closed vessel increased slowly as soon as the pumps were stopped, unless the pumping was carried on continuously for some weeks, when a value remaining constant for years was obtained. This was traced to the formation of skins of gas adhering to the glass, which were gradually stripped off. The depth of these skins varied with the gas used. The importance of such gas-grown skins was apparent when lubricated taps were considered for use in the specific heat apparatus. The use of lubricated glass taps had to be avoided, as, no lubricant with a zero vapour pressure being known, uncertainties would arise due to the formation of gas-grown skins of the volatile lubricant. This was obviated by using mercurial barometric traps when it was necessary to vary the channels of communication.

An interesting effect of the removal of gas-grown skins was shown when observing the meniscus of mercury in an evacuated glass tube. This meniscus became first flat, and after further evacuation concave, showing that when the skins were removed the mercury came into actual contact with the glass, which in the ordinary barometer tube it does not.

In order to test whether air succeeded in entering the apparatus by passing up between the mercury column and the glass tube, a barometric tube with its normal column of mercury, and containing a little air was oscillated up and down. A feeble glow discharge was formed within the tube, and a solid appeared which coated the sides, while the pressure declined instead of increased. This phenomenon was observed when oxygen, nitrogen or air were used, and the solids were found to be mercury oxide, a stable nitride, and a compound containing mercury and ammonium, respectively. The hydride was also obtained after prolonged oscillation when very pure hydrogen was used, but owing to its great instability the compound could not be analysed. To illustrate the universal views on the chemical inertness of helium, an experiment using this gas was also performed, and the very surprising observation was made that although no solid coating appeared on the walls of the tube, after long actuation the pressure of the helium lessened considerably (from 7 mm. to 2.3 mm.). It was very difficult to explain this in any way but by postulating the formation of gaseous mercury helide.

A new apparatus was constructed in which an attempt was made to condense the hypothetical helide in liquid air, and to demonstrate its presence by means of the spectrum. The apparatus was chemically cleaned and dried, highly exhausted, washed out with helium and a stream of gas passed through it. The spectrum tube was carefully guarded from the intrusion of mercury vapour by a vessel containing gold leaf. From the results obtained it was established that at low pressures, and in the presence of a glow discharge, mercury and helium united to form a gaseous helide not condensed at the temperature of liquid air, and giving rise, in common with other gases, to gas-grown skins.

Various synthesizers, within which a glow discharge could be made and varied at will, were constructed, and many experiments made in order to find the most favourable conditions for the formation of the helide. The apparatus in its final form provided for the synthesis and analysis of the helide, and consisted of synthesizers, a heater containing a platinum spiral for the decomposition of the compound, and a tube in which the resulting mercury could be collected and weighed, circulator, Aston microbalance, an ingenious prism arrangement for detecting mercury, McLeod gauge for measuring small pressures, and a cathetometer for the measurement of larger pressures. The data obtained by the extremely careful synthesis and analysis of the helide gave, with one type of synthesizer, the formula $HgHe_{10}$, and with another, $HgHe$ (or equally $(HgHe)_2$). It seems, therefore, that two helides can be formed.

It has to be borne in mind that the quantities of compound dealt with were very minute, and very delicate methods of analysis had to be used, involving extremely accurate quantitative work.

The discovery of this compound, showing as it did that helium was not quite as inert as was universally supposed, caused a great deal of interest and sceptical criticism among scientific investigators both in England and abroad. Each suggestion was taken up, and all objections fully investigated, but every time the results obtained only proved more conclusively the truth of the discovery. The most minute care was taken to ensure the purity of the substances used and the perfect chemical cleanness and dryness of the apparatus. Evidence of increase and decrease of pressure, of density by the Aston micro-balance, evidence from the interferometer and the spectroscope, all favour the production of the helide. As still further evidence, the absorption line in the ultra-violet predicted by Professor Henri was obtained when using a quartz spectrograph. Finally, similar experiments were carried out with argon, when it was found that no pressure change took place and no mercury was found in the decomposition tube. This showed that argon and mercury did not combine, and that no mercury was electrically or mechanically transported into the decomposition tube, but any found there was due to the decomposition of the helide.

The lecture was illustrated by slides, showing the apparatus used, and giving tables of quantitative results.

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Obituary Notices.

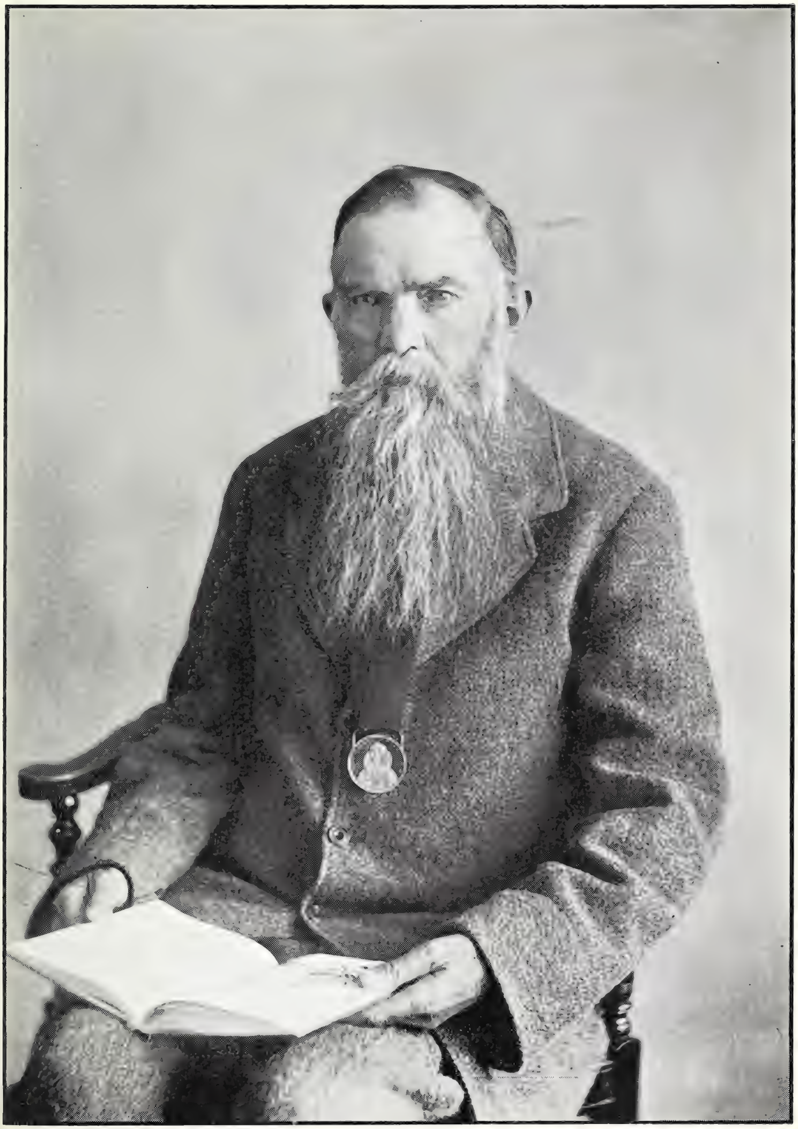
Henry James Waddington, F.L.S., F.R. Micr.S.

Yet another of the rapidly diminishing band of Original Members has passed away, after a career devoted, to his latest moments, to scientific investigation. His advanced age had for many years precluded the possibility of active participation in the work of the Society; his last appearance in our rooms nine years ago was due to the award of the Morris Gold Medal, bestowed upon him in recognition of " his distinguished services in promoting the study of Natural Science." The ceremony is duly chronicled in Vol. XIV of our Proceedings, accompanied by a full account of his life work, of which the more important fruits were contributed to the Natural History Museum at S. Kensington.

Mr. Waddington held the office of President of our Society in the Session 1906-7. His address was a striking résumé of progress in every walk of science during the previous twelve months. It may be found in the 4th Annual Report of the Society (1907). Other volumes round about that period contain many proofs of his activity as a member, more particularly in connection with Microscopical researches, nor must it be forgotten that his discovery of the larvæ of the Anopheles bifurcatus on the waters of Poole Park led to such active treatment by the Local Government Board as to secure for the district immunity from the mosquito pest, " a striking example of the value of scientific research in contributing to the health and comfort of the community."

Richard Vowell Sherring, F.L.S.

In past years Mr. Sherring had been a tower of strength to our Society. He was one of the principal instruments in its re-auguration in 1903; in the following year he was elected member of the Council, and in 1916 was appointed a Vice-President. His chief interest lay in the Botanical Section, of which he was Secretary for many years, and which owed much of its success in the investigation of the local Flora to his leadership in its Excursions. The Society's keen appreciation of his services was shown in 1921, when he was selected as the first recipient of the Morris Gold Medal. An account of the presentation may be found in Vol. XIII of our Proceedings, and includes a full record of his distinguished career in the field of West Indian Exploration. In particular may be noted the study of the Flora of Grenada which increased the known number of species from



R. VOWELL SHERRING.

BRITISH MU
NATURA

6. to 100, four new species of ferns and one orchid being named after the discoverer.

In Mr. Sherring's early days Entomology engaged a good deal of his interest, and in Geology his work in the Mendips led to a connexion with the British Association and to his nomination as Fellow of the Geological Society.

His field of scientific interest was in fact wide-spread, and it is not surprising to find him among the active supporters of a scheme which, started in 1898, culminated in the erection of the Science and Art Technical School at Pokesdown now under the control of the Borough Education Committee. His aspiration was " to help to build up others " in the pursuit of Science, as he himself had been helped in his youth by many members of the Bristol Naturalists' Society, to requite the debt which he himself generously acknowledged.

Frederick Beatson Taylor, B.A.

It is interesting to note that the scientific investigations by which Mr. Taylor will be known for all time only began when he had attained an age at which many men regard their life's work as done. After a normal course at Christ's Hospital and King's College, Cambridge, he entered the Indian Civil Service, in which he rose to the position of Acting Judge in the High Court. His publication of " The Trial of Cases " was followed by his retirement, on grounds of ill-health, in 1901, and he then settled at Lyndhurst, removing after 14 years to Bournemouth, where he at once joined our Society. Three years afterwards he was elected to the Council. For five years (1920-5) he edited the Proceedings, and for eight years (1922-30) he was Chairman of the Microscopical Section. It was in this department that he found scope for his careful observation and minute accuracy. He had long been interested in the study of Diatoms and had compiled an " Atlas " of permanent interest and value, which ultimately extended to fifteen volumes. This was followed by " The Literature of Diatoms " published in the Transactions of the American Microscopical Society (Vol. XL), a brief survey of all the more important contributions to diatomology from Agardh's " Systema Algarum " onwards. In 1928 his Paper on " Diatoms " was published in our Proceedings (Vol. XIX), and in the following year this was expanded into his monumental work " Notes on Diatoms," a small octavo volume, with five plates drawn by himself at the advanced age of 78, an admirable and concise exposition of diatoms treated from every conceivable aspect and indispensable to the student who may be anxious to avoid the labour of tracing species in obscure " Articles " or half-forgotten " Papers." Few of us perhaps had realised that under his quiet, modest demeanour lay a great strength of purpose and a persistent patience in scientific research.

Historical Lists of Officers of the Society.

COMPILED BY THE LATE MR. R. A. DE PAIVA.

Presidents

1903-4	J. E. Beale (Mayor of Bournemouth).
1904-5—1905-6	G. E. J. Crallan, M.A., M.B., M.R.C.S.
1906-7	H. J. Waddington, F.L.S.
1907-8—1908-9	A. Ransome, M.A., M.D., F.R.C.P., F.R.S.
1909-10	Dr. A. Smith Woodward, F.R.S., F.L.S., F.G.S.
1910-11	Dr. Dukinfield H. Scott, M.A., LL.D., F.R.S., F.L.S., F.G.S.
1911-12 — 1912-13	Sir E. Ray Lankester, K.C.B., M.A., LL.D., F.R.S., F.L.S.
1913-14 — 1914-15 —1915-16	Sir Daniel Morris, K.C.M.G., J.P., M.A., D.SC., D.C.L., F.L.S
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1924-25 — 1925-26	Hubert Painter, B.SC., F.C.S.
1926-27 — 1927-28	Heywood Sumner, F.S.A.
1928-29	Claude Lyon.
1929-30	Professor F. O. Bower, D.SC., F.R.S.
1930-31	Henry Bury, M.A., F.L.S., F.G.S.
1931-32	Dr. Dukinfield Scott, M.A., LL.D., F.R.S., F.L.S., F.G.S.

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1905-14	G. Brownen, F.C.S.
1906-	G. E. J. Crallan, M.A., M.B., M.R.C.S.
1921-25	Field Marshall Lord Grenfell of Kilvey, G.C.B., G.C.M.G., LL.D., F.S.A.
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1916-24—1926	Hubert Painter, B.SC., F.C.S.
1916-21—1923-	F. G. Penrose, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U.
1909-21	A. Ransome, M.A., M.D., F.R.C.P., F.R.S.
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1928-	Heywood Sumner, F.S.A.
1928-30—31-	Henry Bury, M.A., F.L.S., F.G.S.
1929	J. H. Ralph Smythe, J.P.
1931-	Rev. A. G. Yates, M.A.

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1906-7 ... ... H. J. Waddington, F.L.S.
1907-10 ... ... W. T. Ord, F.G.S.

Chairmen of Council

1910-11 ... .. W. T. Ord, F.G.S.
1911-14 ... .. Sir Daniel Morris, K.C.M.G., J.P., M.A., D.SC., D.C.L., F.L.S
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1916-17 ... ... Sir Daniel Morris, K.C.M.G., J.P., M.A., D.SC., D.C.L., F.L.S.
1917-Feb. 19 ... W. Munn Rankin, M.SC., B.SC.
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1922-27 ... ... J. H. Ralph Smythe, J.P.
1927- ... ... Rev. C. O. S. Hatton, B.A., F.L.S.

Deputy Chairmen of Council

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1914-Feb. 16 ... Henry Backhouse, F.R.H.S.
1916 Mar.-Nov. 16 R. O'B. Furlong, C.B., J.P., M.A.
1916 Dec.-17 ... W. Munn Rankin, M.SC., B.SC.
1917-19 ... ... F. G. Penrose, M.D,, F.R.C.P., F.Z.S., M.B.O.U.
1919-20 ... ... Hubert Painter, B.SC., F.C.S.
1920-22 ... ... J. H. Ralph Smythe, J.P.
1922-27 ... ... Rev. C. O. S. Hatton, B.A., F.L.S.
1927-28 ... ... J. H. Ralph Smythe, J.P.
1928 ... ... Claude Lyon
1929-31 ... ... F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
1931- ... ... Henry Bury, M.A., F.L.S., F.G.S.

Hon. Treasurers

1904-8 ... ... A. D. George.
1908- ... ... G. Brumell, A.R.I.B.A.

Hon. Secretaries

1904-7 ... ... Miss C. Agnes Rooper and J. R. L. Dixon, M.R.C.S., L.R.C.P.
1907-8 ... ... J. R. L. Dixon, M.R.C.S., L.R.C.P., and H. Backhouse, F.R.H.S
1908-10 ... ... J. R. L. Dixon, M.R.C.S., L.R.C.P., and Col. E. E Markwick, C.B., C.B.E., F.R.A.S.
1910 Sept.-Oct. ... J. Donkin, F.R.I.B.A.
1910-11 ... ... H. Le Jeune.
1911 Nov.-Feb. 1912 Sir A. Brooke Pechell, BART., M.B.
1912 Apr.-Mar. 1914 T. Michell, M.I.C.E.
1914 Apr.-Oct. ... R. A. de Paiva.
1914 Oct.-July 1917 R. A. de Paiva and T. Capper, M.A., B.SC.,
1917 July-25 ... R. A. de Paiva.
1925-26 ... ... R. A. de Paiva and Rev. A. G. Yates, M.A., R.N.,
1926-31 ... ... Rev. A. G. Yates, M.A., R.N.
1931- ... ... M. Hellier, O.B.E.

Hon. Assistant Secretaries

Apr. 1911-1912	T. Michell, M.I.C.E.
May Mar. 1912-1914	R. A. de Paiva.
1917-1918	G. G. Grace, B.Sc., A.R.C.Sc., F.E.S.
1919-1920	W. G. Boul, M.A., LL.D., D.C.L.
1920-	W. J. Woodhouse, A.C.P., M.I.H.
1931	M. Hellier, O.B.E.

Hon. Financial Secretary

1905-8	J. H. Scott, M.E., M.I.M.C.E.

Assistant Secretary

1909-	J. F. Spencer.

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1908-1909	A. Scott, B.A.
1909-1911	F. I. Cooke.
1911-1912	W. Munn Rankin, M.Sc., B.Sc.
1913-1919	H. J. Ellis.
1919 Oct.- Mar. 1926	J. Omer Cooper, F.E.S.
1920 Mar.- Jan. 1921	Rev. C. O. S. Hatton, B.A., F.L.S.
1921 Jan.-	Claude Lyon.
1923-1929	Miss A. G. Veale, Hon. Assistant Librarian.
1929-	S. Whitaker, Hon. Assistant Librarian.

Hon. Editors

1911-12	G. E. J. Crallan, M.A., M.B., M.R.C.S.
1912-20	Hubert Painter, B.Sc., F.C.S.
1920-25	F. B. Taylor, B.A.
1925-	J. R. White, M.A.

Hon. Curators

1917 Jan.- July 1921	W. G. Wallace.
1921-Dec. 1922	No Curator.
1923 Jan.-Nov.	Rev. C. O. S. Hatton, B.A., F.L.S., and Howard Lacey, B.A.
1923 Dec.-	Rev. C. O. S. Hatton, B.A., F.L.S.

Chairmen of Sections.

Antiquarian

1904-7	A. W. Thomas, M.D., M.R.C.S.

Archæological and Historical

1907-8	A. W. Thomas, M.D., M.R.C.S.
1908-Feb. 14	G. Brownen, F.C.S.
1914 May-Nov.	Rev. Canon T. E. Usherwood, M.A.
1914 Dec.-24	Rev. H. Shaen Solly, M.A.
1924-26	Col. J. R. Dodd, M.D., F.R.C.S.
1926-	R. K. Cardew, B.A.

Deputy Chairmen

1922-24	Col. J. R. Dodd, M.D., F.R.C.S.
1925-26	R. K. Cardew, B.A.

Astronomical

1920-24	Col. E. E. Markwick, c.b., c.b.e., f.r.a.s.
1925-26	G. E. J. Crallan, m.a., m.b., m.r.c.s.
1928-29	L. B. Benny, m.a., b.sc., f.r.a.s.
1929-31	J. A. Formoy, f.r.a.s.
1931-	W. Goodacre, f.r.a.s.

Deputy-Chairmen

1927-28	L. B. Benny, m.a., b.sc., f.r.a.s.
1931	W. Goodacre, f.r.a.s.

Mathematical

1921-22	W. H. Scott, m.a
1922-24	B. M. Peek, m.a., f.r.a.s.

Astronomical and Mathematical

1924-25	B. M. Peek, m.a., f.r.a.s.

Botanical

1904-5	Rev. E. F. Linton, m.a., f.l.s.
1905-7	J. F. Rayner, f.r.h.s.
1907-May 18	Miss C. Agnes Rooper.
1918-22	Rev. C. O. S. Hatton, b.a., f.l.s.
1922-26	Howard Lacey, b.a.
1926-27	Rev. C. O. S. Hatton, b.a., f.l.s.
1927-	L. Beeching Hall, f.l.s.

Entomological

1914-15	R. Beck, f.e.s.
1915-Dec. 19	F. G. Penrose, m.d., f.r.c.p., f.z.s., m.b.o.u.
1920-Jan. 26	J. Neale, b.a.
1926-29	Howard Lacey, b.a.
1929-	Alan Druitt, f.e.s.

Geographical

1908-10	J. E. Liddiard, f.r.g.s.
1910-11	A. Scott, b.a.
1911-16	G. de Castro, m.r.c.s.
1916-	Claude Lyon.

Geological

1904-5	Rev. G. D. Shenton, b.a.
1905-6	The Marquis de Trevelec.
1906-14	W. T. Ord, f.g.s.
1914-17	W. Munn Rankin, m.sc., b.sc.
1917-18	H. Kidner, f.g.s.
1918-20	W. Munn Rankin, m.sc., b.sc.
1920-23	W. J. Woodhouse, a.c.p., m.i.h.
1923-	Henry Bury, m.a., f.l.s., f.g.s.

Photographic

1905-8	Councillor R. Y. Banks.
1908-10	C. J. Hankinson, j.p.
1910-12	E. W. Barlow, f.r.a.s.
1912-13	G. Brumell, a.r.i.b.a.
1913-14	No Chairman.
1914-16	R. Y. Banks.

Photographic and Record

1916-25 ... ... R. Y. Banks.
1925-30 ... ... W. Dieselhorst, A.M.I.C.E.
1930- ... ... S. Whitaker.

Physical

1904-26 ... ... Hubert Painter, B.Sc., F.C.S.
1928-29 ... ... G. E. J. Crallan, M.A., M.B., M.R.C.S.
1929- ... ... Miss Marcia Penrose, B.Sc.

Deputy Chairman

1926-28 ... ... G. E. J. Crallan, M.A., M.B., M.R.C.S.

Zoological

1904-8 ... ... G. E. J. Crallan, M.A., M.B., M.R.C.S.
1908-10 ... ... A. W. Thomas, M.D., M.R.C.S.
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1922-31 ... ... F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U
1931- ... ... Rev. F. C. R. Jourdain, M.A., F.Z.S., M.B.O.U.

Microscopical

1909 Mar.-10 ... J. R. L. Dixon, M.R.C.S., L.R.C.P.
1913-14 ... ... H. B. Wells, F.R.M.S.
1922-30 ... F. B. Taylor, B.A.
1930-31 ... ... F. W. Parrot.
1931- ... ... S. Whitaker.

Zoological and Microscopical

1910-11 ... ... H. B. Wells, F.R.M.S.
A. W. Thomas, M.D., M.R.C.S.
1911 Mar.-12 ... G. E. J. Crallan, M.A., M.B., M.R.C.S.
1911-13 ... ... H. B. Wells, F.R.M.S.
1914-16 ... ... T. B. Goodall, F.R.C.V.S., F.L.S.
1916-22 ... ... F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.

Elected and co-opted Members of Council.

Title changed from Committee in 1910.

Many of these also had seats on the Council ex-officio either before or after their election or co-option. Their names are marked*

1905-7	Atkins, Dr. F.
1906-7—1908-30	*Backhouse, H., F.R.H.S.
1914-15	*Banks, R. Y.
1905-6	Bax, P. B. Ironside.
1904	Bond, Dr. Eleanor.
1919-20	Boul, Mrs.
1930-	Broad, F.
1904-8	*Brownen, G., F.C.S.
1906-8	*Brumell, G., A.R.I.B.A.
1906-8	Buckland, Dr. Frank.
1930-	Burton, E. St. John, F.L.S., F.G.S., F.Z.S.
1921-22	*Cardew, R. K., B.A.
1909-11	Chandler, S. Whitty, B.A.
1905-6	Clements, Lt.-Col. W. G.
1904	Clift, Dr.
1921-28	Curme, Mrs.
1905-10	Curtis, W. Parkinson, F.E.S
1923-26—1927-30	*Dodd, Col. J. R., M.D., F.R.C.S.
1914-16	Druitt, J., J.P.
1916-17	Dyer, J. Herbert.
1919-25	*Ellis, H. J.
1910-30	French, J. M.
1929-	Fryer, Miss C. H.
1914-17	Furlong, R. O'B., C.B., M.A.
1919-Aug. 21	*George, A. D.
1904	Giles, Dr.
1904-6	*Goodall, T. B., F.R.C.V.S., F.L.S.
1918-20	Gosse, W., M.D., D.P.H.
1921-23	Gray, Arthur.
1910-15	Hamilton, G. G., M.B., F.R.C.S.
1916-18— 1922-23	*Hatton, Rev. C. O. S., B.A., F.L.S.
1911-16	Hill, S. McCalmont, D.C.L.
1926-30	Hurry, J. B., M.A., M.D.
1916-19	Jeffery, T. J. P.
1930-	*Jourdain, Rev. F. C. R., M.A., M.B.O.U., F.Z.S.
1906-10 — 1911-18	*Le Jeune, H.
1926-	Longbottom, F. W., F.R.A.S.
1914-16	*Lyon, Claude.
1907-8	*Markwick, Col. E. E., C.B., C.B.E., F.R.A.S.
1907-8	Maude, W. C., J.P.
1910-16	*Morris, Sir Daniel, K.C.M.G., J.P., M.A., D.SC., LL.D., F.L.S.
1910-11	*Michell, T., M.I.C.E.
1916-19	*Neale, Joseph, B.A.
1905-6	*Ord, W. T., F.G.S.
1904	Parish, Miss
1915-16—31-	*Penrose, F. G., M.D., F.R.C.P., F.Z.S., M.B.O.U.
1917-18	*Rankin, W. Munn, M.SC., B.SC.
1904	Reid, C. J.
1931-	Richey, H. A., B.A.
1919-	Rooke, Miss S. G.
1918-19	Rothwell, Mrs.
1908-9	Scott, A., B.A.
1908-31	*Scott, J. H., M.E., M.I.M.C.E
1904-26	Sherring, R. Vowell, F.L.S.
1920-27	Simpson, Rev. E. J. Douglas, M.A.
1916-29	Smythe, J. H. Ralph, J.P.

1923-	*Spencer, J. F.
1905-10	Stubbs, G. M.
1918-20	*Taylor, F. B., B.A.
1931-	Wadlow, H. J.
1921-23	*Wallace, W. G.
1907-10	*Wells, H. B., F.R.M.S.
1931-	Wetherell, Miss S.
1930-31	*Whitaker, S.
1906-7 — 1916-20 1923-	*Woodhouse, W. J., A.C.P., M.I.H.

Various Committees

Chairman: Rev. C. O. S. Hatton, B.A., F.L.S.

1915 Dec.-Oct. 1919	General Policy of the Society.
1919 Nov.-Feb. 1920	Housing.
1920 Feb.-Oct. 1922	Housing and Finance
1922-	Finance and General Purposes.

Library Committee

Chairmen

1918 Mar.-Oct. 1918	G. G. Grace, B.SC., A.R.C.SC., F.E.S.
1918 Nov.-Oct. 1919	Hubert Painter, B.SC., F.C.S.
1919 Nov.-	Rev. C. O. S. Hatton, B.A., F.L.S.

Museum Committee

Chairmen

1917-1921	W. G. Wallace.
1921-	Rev. C. O. S. Hatton, B.A., F.L.S.

Hon. Auditors.

1906-9	H. Sutton and K. H. Mundell.
1909-14	H. Sutton and E. Bicker.
1914-15	E. Bicker and H. Backhouse, F.R.H.S.
1915-17	E. Bicker and E. W. Barlow, F.R.A.S.
1917-28	E. Bicker and C. H. Blackett.
1928-	E. Bicker and Son, and F. Broad.

Council for the Current Year, 1931-32

The Officers, and Chairmen of Sections (*ex-officio*)
F. Broad
E. St. John Burton, F.G.S., F.L.S.
Miss C. H. Fryer
F. W. Longbottom, F.R.A.S.
H. A. Richey, B.A.
Miss S. G. Rooke
J. F. Spencer
H. J. Wadlow
Miss S. Wetherell
W. J. Woodhouse, A.C.P.

Committees for the Current Year.

Finance and General Purposes

Rev. C. O. S. Hatton, B.A., F.L.S. (Chairman)
The Hon. Treasurer (G. Brumell, A.R.I.B.A.)
F. Broad
Claude Lyon
The Hon. Secretary (M. Hellier, O.B.E.)
H. Bury, M.A., F.L.S., F.G.S.
G. E. J. Crallan, M.A., M.B., M.R.C.S.
F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
J. R. White, M.A.

Library

Rev. C. O. S. Hatton, B.A., F.L.S. (Chairman)
F. G. Penrose, M.D., F.R.C.P. F.Z.S., M.B.O.U.

G. E. J. Crallan, M.A., M.B., M.R.C.S.
Claude Lyon (Hon. Librarian)
J. R. White, M.A.
S. Whitaker

Museum

The Hon. Curator (Chairman)
(Rev. C. O. S. Hatton, B.A., F.L.S.)
Chairman of Archæological Section
(R. K. Cardew, B.A.)
Chairman of Botanical Section
(L. Beeching Hall, F.L.S.)
Chairman of Entomological Section
(Alan Druitt, F.E.S.)

Chairman of Geological Section
(Henry Bury, M.A., F.L.S., F.G.S.)
Chairman of Zoological Section
(Rev. F. C. R. Jourdain, M.A., M.B.O.U., F.Z.S.)
G. E. J. Crallan, M.A., M.B., M.R.C.S.
E. St. J. Burton, F.L.S., F.G.S., F.Z.S.
F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.

Editorial

The Hon. Editor (Chairman)
((J. R. White, M.A.)
The Hon. Treasurer
(G. Brumell, A.R.I.B.A.)

The Hon. Secretary
(M. Hellier, O.B.E.)
G. E. J. Crallan, M.A., M.B., M.R.C.S.
Henry Bury, M.A., F.L.S., F.G.S.

Garden

Rev. C. O. S. Hatton, B.A., F.L.S. (Chairman)
Chairman of Botanical Section
(L. Beeching Hall, F.L.S.)

Miss S. G. Rooke
Miss S. Wetherell
H. J. Wadlow
Miss Fryer

Tea

Miss Wetherell
Miss Barratt
Mrs. Howell

Miss Ousby-Trew
Miss Roden

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